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A particular feature of this issue is the complete set of plans and specifications for a genuine Hand V-bottom 30-foot cruiser. Never before has a series such as this been attempted. These plans are complete in every detail and ready to be used for the construction of a boat. Each month throughout 1920 an entirely new and original set of plans is to be published.

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and Quality to Individual Specifications.*

Standardization Finally Reached

Trend at the Motor Boat Show Clearly
Indicates that the Era of Stock Models
of Cruisers and Runabouts Is at Hand

By Alfred F. Loomis



Photographs by
M. Rosenfeld
and E. Levick

*The International 32-
footers the real hit of the show and the
first practical result of standardization*

THERE are a number of criterions by which one can judge of the success of a motor boat show. Take, for instance, the attendance of the small boys, and the amount of descriptive literature they cram into bulging pockets while explaining to harassed parents the superiority of a 16-foot fast runabout over a 10-foot rowboat. Or it is possible to judge from the number and variety of boats and engines on view, and the general interest displayed in them. Or, if one were basely materialistic, he might quote



A Hacker 35-footer built for the Fisher Trophy Race and powered with two Hall-Scott marine motors. The whole outfit represents the highest degree of perfection ever reached



The Elco Cruisette, a new model powered with a J. V. B. motor

the number of sales listed by an invincible army of boat, engine, and accessory salesmen. Looked at from any angle, the fifteenth annual show of the National Association of Engine and Boat Manufacturers which packed the first two floors of the Grand Central Palace from February 20 to 28 was a distinct success. The exhibits were there in great profusion; printers all over the country had worked overtime to prepare circulars for the delectation of Young America; and the representatives of the marine industry wore out countless lead pencils booking orders for anything from an express cruiser up to a year's subscription for **MoToR BOATING**. From all indications, 1920 will be a banner year for the devotees of the finest sport that floats.

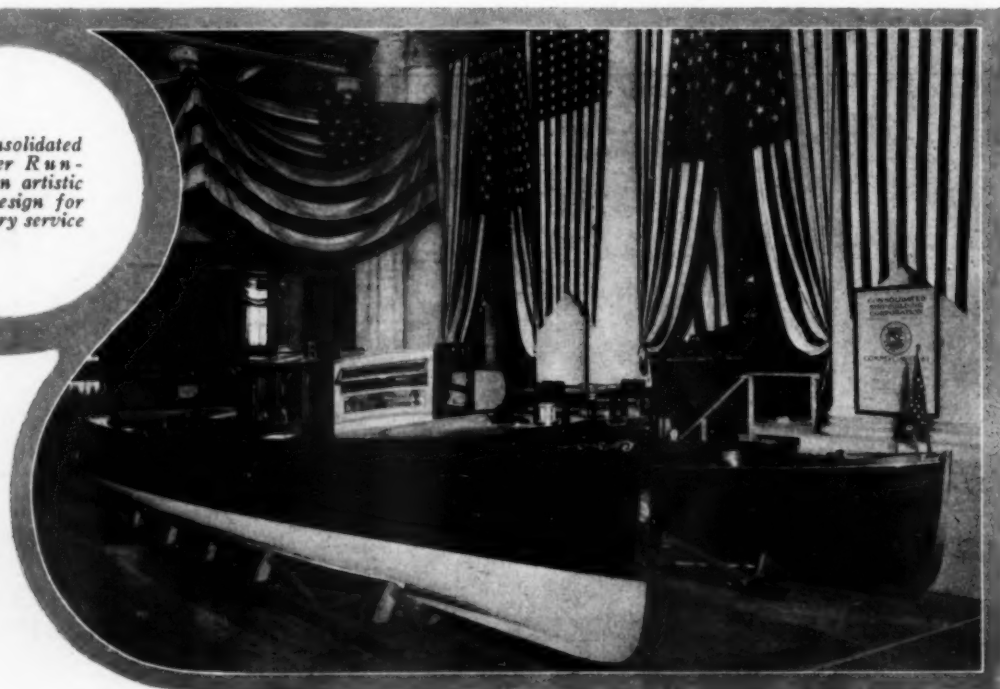
Naturally enough, interest centered in the motor boats, of

exact—the boating public was given opportunity to view intimately no less than four models of the cruiser type. The popularity of this length of hull is fully established. If only a third of the people of both sexes who climbed the gangways to poke around in the lockers and drawers of the demonstration models were to invest in 32-footers this season there wouldn't be enough oak left in the national forests to build a mahogany steering wheel.

As you came upon the main floor of the Palace and bore away to the right, the first 32-footer to meet the gaze was the Cruisette model put out as stock by the Elco Company. Here was a pleasing flush deck design that gave the appearance of roominess with the utmost ease of control. Having

(Continued on page 64)

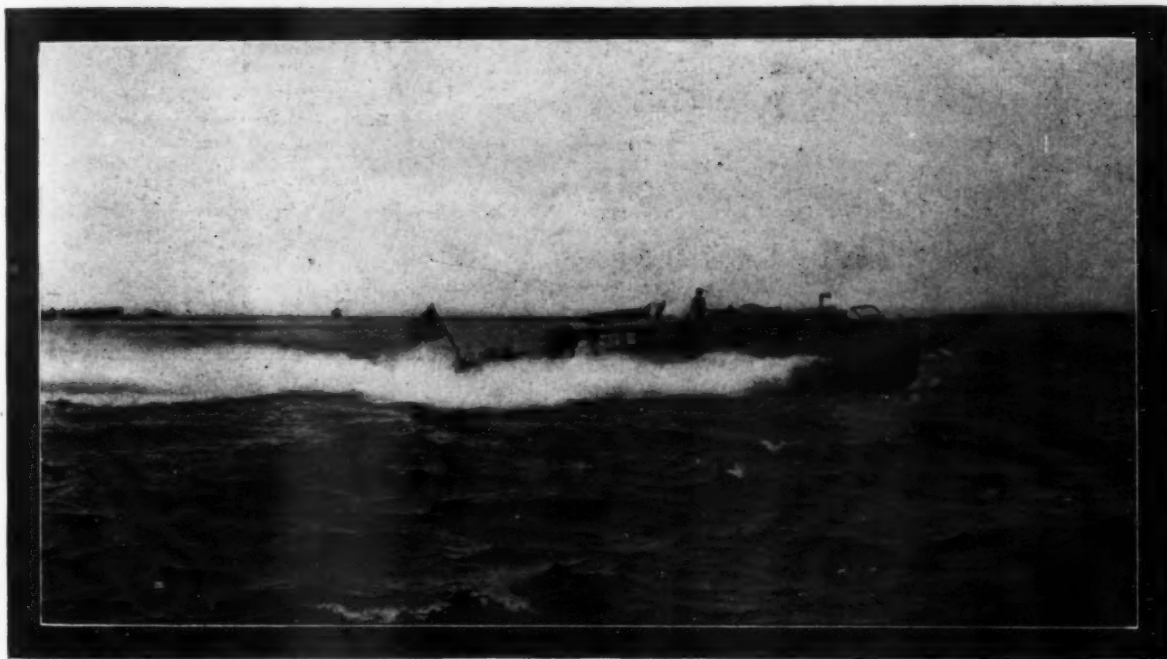
The Consolidated Speedster Run—about an artistic stock design for fast ferry service



Miami Races Demonstrate What A Real Express Cruiser Is

In the Florida Long Distance Races on the High Seas the Stock Marine Motor Proves Its Worth and Reliability While the Aviation Engine Fails for Offshore Work

By Gordon Nye



The winner of the first two races at Miami, Hoosier V., powered with a pair of stock Sterling motors of 200 h.p. each

HATS off to the racing committee in charge of the Miami mid-winter regatta.

It is working under racing rules that have practically eliminated freak or "rule-beater" express cruisers; and that is a long forward step in boat racing sportsmanship. The committee feels that the time has arrived for all boat builders, motor manufacturers and boat owners to develop a standard fast boat which will not only be able to run at a high rate of speed in smooth water but which will also be able to go to sea in any but the worst kind of weather—in other words, a boat that is in fact what its name implies.

The trouble with the Miami mid-winter races heretofore has been that all races were held in Biscayne Bay, which is a wonderful body of smooth water and roomy enough for a two-mile oval-shaped course—but in such a small space the small swift boat always had the advantage and usually won for the reason that the heavier and more powerful boats could not be manoeuvred with the ease of the smaller boats—consequently it wasn't always the best boat that carried away the cups.

This year the racing commission made a radical change in these rules and decided that before the bay races, March fifth and sixth, there should be three outside long distance races for boats coming within the classification of express cruisers. One of these races was to Bimini and return, 106 miles; another one to Palm Beach and return, 138 miles; and the third race to Key West, 157 miles, and that express cruisers that raced in the bay for the championship would have to qualify in at least one of the outside long-distance races.

The rules follow: "All boats covering the course fairly and finishing will be awarded one point for starting and one point for every boat defeated in the 10-mile race. Two points for starting and two points for each boat defeated in the 20-mile race. Three points for starting and three points

for each boat defeated in Bimini race. Four points for starting and four points for each boat defeated in Palm Beach race. Five points for starting and five points for each boat defeated in the Key West race.

"A boat which starts and does not finish will receive the allotment of points for starting as indicated above.

"The greatest number of starters in any race in any class will be the basis for figuring points won in all races.

"All races in each class will constitute a series for that class.

"The boat scoring the greatest number of points in the series of races will be awarded first place for that class; the boat scoring the next greatest number will be given second place, and the boat scoring the third greatest number, third place."

At the time this article is being prepared two of these races have been held with some interesting results. The first race to Bimini and return on February fourteenth with Hoosier V, owned by H. R. Duckwall; Shadow V, owned by Carl G. Fisher; Altonia, owned by Arthur C. Newby; and Gar, Jr., owned by Gar Wood, at the starting line. The latter boat had caused considerable discussion previous to the races as the racing commission did not feel that Gar, Jr., came within the requirements of an express cruiser—but the committee later waived its objections and the boat was allowed to enter.

The day was bright and clear and the water smooth in the bay and half across the Gulf Stream to Bimini. Hoosier V lead out through the government cut and maintained her lead for the first five miles. At that point Shadow V pulled ahead and held her position until within ten miles of the turning buoy at Bimini when Hoosier V again forged to the front. From that point on it settled down to the steady grind with rough water two-thirds of the way back.



Gar, Jr., the famous Detroit boat which had difficulties at sea in the heavy ocean swells

The race was won by Hoosier V. Time, 3 hours, 55-53. Second, Altonia. Time, 3 hours, 59-50. Third, Shadow V. Time, 4 hours, 9-25.

Gar, Jr., did not get away with the rest. For some reason the Liberty motor didn't run and it was not until one hour and eight minutes after the other boats had started that the Gar, Jr. finally got under way. This boat also caused considerable anxiety on the part of the racing officials for the reason that she did not return until hours after all other boats were back and as the sea had developed a considerable swell during the day the committee in charge of the races hurried other racing boats and two aeroplanes to search for Gar, Jr. The aeroplanes located the boat without difficulty and reported that the crew was having engine trouble. She finally returned under her own power about seven o'clock that night, having been forced to put into Bimini for repairs.

The second race to Palm Beach and return proved a real test. A "northeaster" was blowing and there was a wild chop outside of the bar that grew rougher as the boats neared Palm Beach, away from the protection of the coast-line reef.

The same four boats were at the starting line and at the sound of the starting gun they leaped forward like a flash. The race through the bay was as pretty a picture as one could well imagine. The three heavier express cruisers were almost in a line while Gar, Jr. was leading and running like an express train. By the time the boats had covered the bay channel and reached the government cut, a distance in the neighborhood of four and one-half miles, Gar, Jr. was leading by one-half mile, but her easily won position in smooth water didn't last long. When the boats pushed their noses through the government cut out into the teeth of a stiff northeast wind and a sea that was so choppy that at times it appeared as though the boats were completely out of the water and jumping from one sea mountain to the other, Gar, Jr. was forced to turn back and seek shelter in the harbor.

The second boat to turn back was Altonia. After standing the buffeting for about twenty miles north, at which time the sea was extremely rough and smashed some of the glass



Altonia, an express cruiser with a 300 h.p. Speedway motor, the runner-up in the first race

in front of the boat, she was forced to return for shelter.

But Hoosier V and Shadow V "stayed put," and plowed their way north to Palm Beach and returned in remarkably quick time. Hoosier V again won the race in 5 hours, 8-32, while Shadow V covered the distance in 6 hours, 16-35.

For the information of boat fans we will give a brief summary of the boats.

The following data covers the boats: Hoosier V, express cruiser, owned by H. R. Duckwall, built by Geo. Lawley Sons Corp., Boston, Mass.; length 43 feet, beam 10 feet, Sterling engine, six cylinders, bore and stroke $5\frac{3}{4} \times 6\frac{3}{4}$; 400 h.p. Altonia, express cruiser, owned by Arthur C. Newly, built by Purdy Boat Co., Miami Beach, Fla.; length 42 feet, beam 9 feet, Speedway engine, six cylinders, bore and stroke $5\frac{3}{4} \times 7$; 300 h.p. Shadow V, express cruiser, owned by Carl G. Fisher, built by the Purdy Boat Co., Miami Beach, Fla.; length 46 feet, beam 10 feet 4 inches, Speedway engine, six cylinders, bore and stroke $5\frac{3}{4} \times 7$; 300 h.p. Gar, Jr., express cruiser, owned by Gar Wood, built by C. C. Smith Boat & Engine Co., Algonac, Mich.; length 30 feet, beam 9 feet, converted Liberty engine, twelve cylinders, bore and stroke 5×7 ; 400 h.p.

How Fast Is She?

The Speed of One's Boat Is Always a Point of Argument on Which No Authorities Agree—
Means of Determining Speed with a Fair Degree of Accuracy

By Gershon Bradford

IN the practice of navigation one of the essential requirements is a knowledge of the rate of speed maintained and the distance made through the water by the ship. This is a very difficult problem to handle for the reason that motion through the water is not susceptible of easy measurement by the navigator.

There are various devices, called under the general terms of logs, which are used in measuring speed or distance run. These comprise mainly, the so-called patent log, the Nicholson log, and the chip log, or as the English term it, the log ship.

The patent log consists of a cylindrical piece of brass carrying wings or blades, so placed as to cause the cylinder to revolve when drawn through the water. The line attached to this rotator is of a hard-laid variety that will not twist, but transfers the turns to an indicator on the taffrail where the number of miles is registered. This is the most popular form of log used on sea-going vessels. It, however, has to be carefully adjusted and its rate determined, for it is seldom that they run accurately the actual distance.

The rate of a log may be determined by running between two points where the distance is known. The procedure is to take the reading when exactly abreast a well-known and charted object and laying a direct course until another such object is abeam and likewise noting the log reading. With the distance covered by log compare with the actual distance measured on the chart. The amount of over-run or under-run will then be evident.

This should be reduced to a percentage in this manner: Suppose the distance by chart was nine and a half miles, and the log showed ten and a quarter miles. Then what percentage of ten and a quarter miles is three-fourths of a mile? Dividing according to the arithmetical rule $(0.75 \div 10.25 = .073)$ shows a little over a seven per cent over-run.

It is essential that there is no current for just so much as there is movement of water ahead or underfoot (astern),

just so much error will appear. By noting carefully the exact time of slack water and choosing a locality where little tidal current exists at any time this error will be largely overcome. Should the rate of the log be excessive and adjusting becomes necessary, a saw cut will be found in the blades close to the end of the cylinder or harpoon; bending this small section so as to exaggerate the normal angle of the blade will speed up the log and vice versa. The patent log should be well lubricated with high-grade oil at frequent intervals.

There is a device known as the Nicholson log, used to some extent in the Navy, that is operated by the forward pressure of water in a pipe open towards the bow. This is communicated to the pilot-house or bridge where it is scaled in the proper units of speed.

It is the general practice to check all logs by the revolutions of the propeller shaft, which is the most accurate way of arriving at a vessel's speed. There is no chance of its becoming fouled by wreckage or gulfweed, or being swallowed by a shark, which is not infrequently the fate of the glistening rotator of the patent log. The danger of the blades of the log becoming bent through careless handling is also eliminated when the propeller revolutions are depended upon. On the Pacific coast more than elsewhere it is the custom to run distance by engine revolutions only.

In motor boats the revolutions of the propeller are not easily determined, very few being equipped with counters, and they are not as steady in their rate of revolving as in larger vessels, so it is unsatisfactory to measure the speed of smaller boats by this method.

This throws us back on the old-fashioned chip log which is hard to beat for simplicity and accuracy for the use of motor boatmen. It was introduced in very early times and has served many generations of mariners in a very efficient manner.

(Continued on page 57)



Getting the boat's speed by means of a chip log

Tremendous Business Ahead for 1920

An Expression on the Part of Some of the Most Prominent Members of the National Association of Engine and Boat Manufacturers on the Outlook for the Coming Season

NEVER before in the history of the boat and engine industry have the prospects for a busy and prosperous season been brighter than they are at the present time. In discussing the status of the industry with many of the most prominent boat and engine builders during the recent

Photographs by
M. Rosenfeld



A. W. Toppan, president of the Toppan Boat Co., one of the leaders in the campaign for stock boats of medium size and power

F. M. Hartman, of the International Shipbuilding Co., who said he didn't know how, but has proven to the public that it is never too late to learn



C. C. Amory, of the Consolidated Shipbuilding Corp., of New York, who have for many years been building high-grade craft

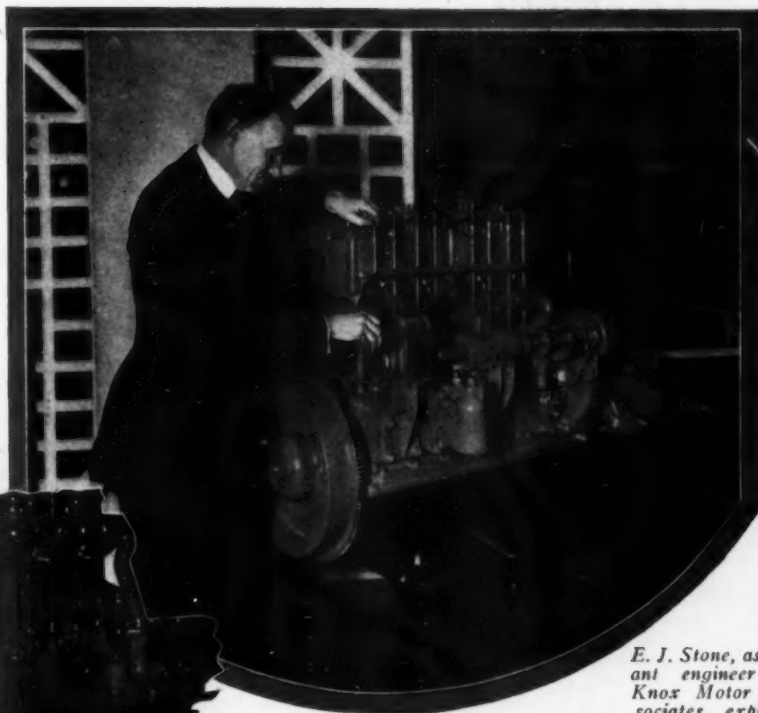


show in New York City there are numerous facts which stand out pre-eminently above all others and are worthy of note.

For instance, a prominent boat builder whose yard is known throughout the world where boats are used admires the pluck of the pioneers who are at last beginning to produce a standardized stock boat. He considers that every stock boat sold is a prospect for a future sale in the higher grade and more expensive boats which his company produces. A point brought out in conversation with this gentleman was that he was greatly in favor of holding the show very much earlier in the winter, in November or thereabouts. His reasons were good, as at that time many people are considering the trip to Florida for its winter boating season and orders could be taken and boats delivered in time to be of use there during the winter.

According to another man who is assistant engineer on the technical staff of a New England motor company, the great possibilities of exhibiting products directly to the ultimate consumer are little realized by the manufacturers in general. The opinions and ideas of motor users can be studied and often a valuable idea is brought out in discussion which results to the benefit of all. Standardization is desirable not only on boats but on motors also, engines naturally fall into three classes, the high-speed racing type, the medium-duty and the slow-speed heavy-duty type. A little more attention to standardization of parts in each of these several classes would not be amiss at all. The possibility of tracing in-

quiries back to their source of origin is also an item which should not be neglected. The most attractive types and most suitable advertising mediums can readily be ascertained by a little diligent research on an occasion like a big show.



E. J. Stone, assistant engineer of Knox Motor Associates, explains some ignition details

W. E. Gibbs, sales manager of Frisbie Motor Co.



M. E. Mutchler, of the Sterling Engine Co., ready to talk about his new pet, the Model G. R. motor made in six and eight-cylinders sizes of 200 and 300 h.p.

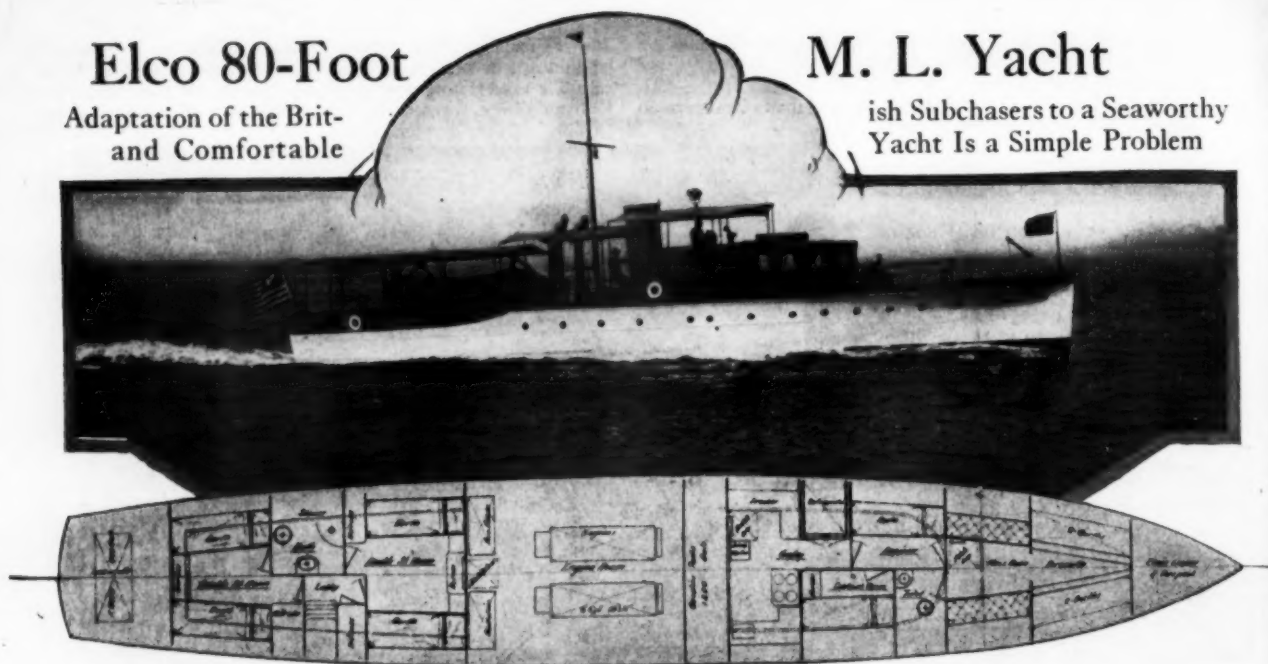
Other exhibitors expressed different opinions, one prominent builder of small types of stock boats was not in favor of an early show at all. His business consists mainly in the delivery from stock of various types of small boats. There is no demand for these in November while in February or March he is hard pressed to be able to supply the demand. The opinion seems to be general that there ought to be more of the type of boat which the ordinary mortal can buy. The superluxurious and highly finished specimens of the boat builder's art are awe-inspiring in their very magnificence. Mr. Ordinary Mortal, strolling about among the exhibits, learning that this boat costs \$30,000 and this one is cheap at \$50,000, breathes a tremendous sigh of relief to find a boat at from \$2,000 to \$4,000. It seems that many people who are unacquainted with the game are frightened away by the impression that the sport is one for the indulgence of the very rich. Let us show the public that the man in moderate circumstances can buy and enjoy the greatest of sports. Let there be more of the stock boats which suit the average man so well. The beginning made in this direction was a good one, and now, having gotten away to a flying start, let the game continue.

Elco 80-Foot

Adaptation of the British Subchasers to a Seaworthy Yacht Is a Simple Problem

M. L. Yacht

ish Subchasers to a Seaworthy Yacht Is a Simple Problem

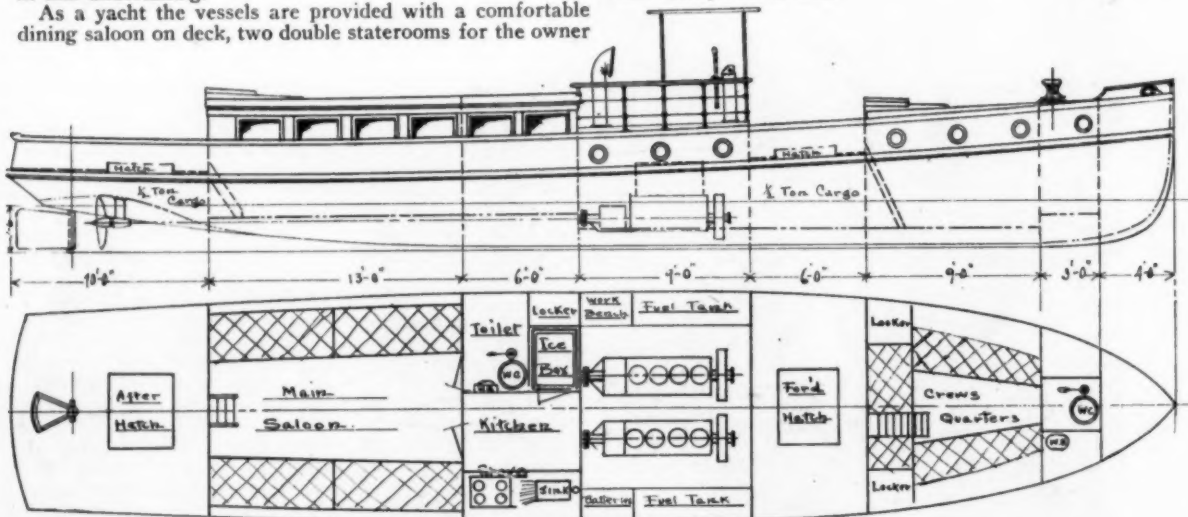


Arrangement plan and outboard view of an 80-foot M. L. Yacht

EMBODYING all of the many valuable features of the British M. L.'s which were found to be practicable for a yacht, this 80-foot Elco boat can be said to be absolutely seaworthy and thoroughly tested in every particular. Over 700 similar boats were built for the use of the British Navy in combating the submarine, and these yachts combine all the experience and knowledge gained in this undertaking.

As a yacht the vessels are provided with a comfortable dining saloon on deck, two double staterooms for the owner

aft, large galley and well equipped crew's quarters forward, with a separate stateroom for the captain and the engineer. The machinery equipment consists of two air-starting and reversing Standard motors of 220 h.p., each giving a speed of 22 miles. This boat is capable of going anywhere in any weather, as was amply demonstrated on many occasions during the last few months when they were on watch in the stormy North Sea.



Plan and profile of tunnel stern work boat designed by J. Murray Watts

Eltoro, 60-Foot Tunnel-Stern Motor Boat

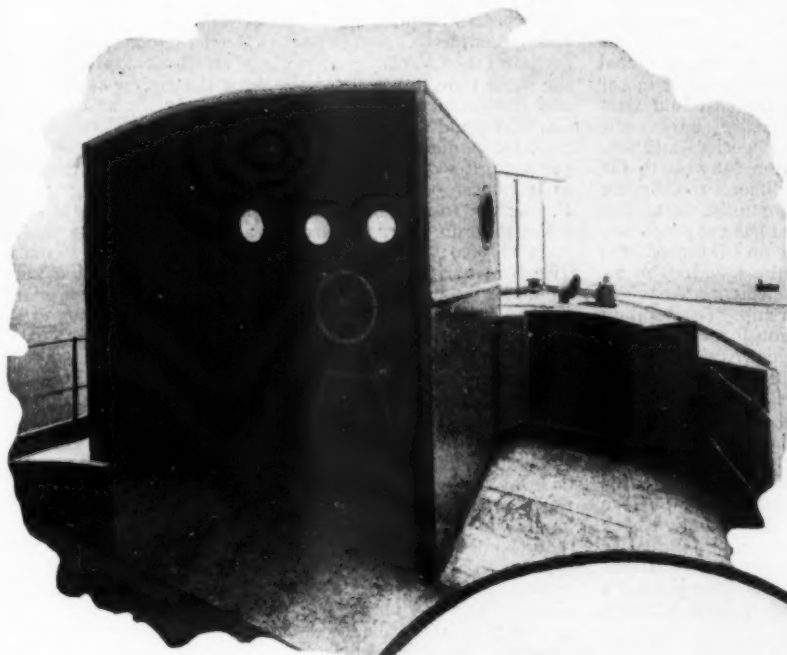
THIS design for a fast and extremely shoal draft work boat was recently turned out by J. Murray Watts. The owner, F. A. Scharberg, stipulated these conditions for the service in which the boat was to operate. She was built at Cartagena, Columbia, by the Cartagena Shipbuilding Company, and is 60 feet long 12 feet beam and 30 inches draft.

Her power equipment is a pair of 100 h.p. Bolinders heavy-oil motors operating 38-inch propellers in two tun-

nels in the stern. These are arranged so that the propellers are well above the bottom of the keel affording ample protection should the boat run aground.

The arrangement provides a main saloon aft with four transom berths, a toilet and galley, opening into the main saloon, an engine-room amidships which contains in addition to the main engines an auxiliary motor for pumping and lighting purposes. A small cargo hold and quarters for the crew are also provided forward.

American Motor Boats to Catch Mexican Smugglers



The steering wheel is protected from the elements and stray bullets

FOR a long time the Mexican Government has been bothered with considerable smuggling carried on by fast motor boats and to successfully combat this illicit trading they ordered from the Nyack Shipbuilding Corporation of Nyack, New York, two fast patrol boats for use in the Mexican Revenue Service.

These boats were designed and built by the Nyack Shipbuilding Corporation and, owing to the definite guarantee of 17 miles per hour which was included in the contract, they specified that a pair of eight-cylinder medium-speed Model MM Van Blerck engines be installed.

Both of these boats were recently completed at Nyack and delivered to the representatives of the Mexican Government, being christened "Maya" and "Tolteca" respectively. Each boat measured 90 x 18 x 4 feet and is of the V-bottom type of construction.

These boats are very heavily constructed and are well able to navigate all waters adjacent to the Mexican coast, either west or east, and in addition to a powerful wireless set they will carry suitable armament to make them-

selves understood regardless of what language the pursued boat may be familiar with. As may be seen by the illustrations, the lessons learned in the construction of patrol boats for the United States and Allied Governments has been turned to good advantage in the design and construction of these two boats.

Fuel capacity for a cruising radius of 400 miles is provided and accommodations include private quarters for twelve revenue officers independent entirely of the regular crew. The crew's quarters consist of accommodations for eight men and a private cabin with bathroom, etc., for the commander. An exceptionally large galley and refrigerator is provided as these boats carry quite a large complement of men at all times.

The engine-room is exceptionally roomy and well lighted and ventilated. The two medium-speed eight-cylinder Van Blerck engines operate at 1,100 r.p.m. and develop between them 268 h.p., which gave these boats at their trials an even average speed of 17½ m.p.h.

Both boats were equipped with Columbian Bronze propellers type H, size 28x22, operating at 1,100 r.p.m.

It is evident that the presence of these boats will be very beneficial and put a stop to smuggling by boats.



The two-cylinder Van Blercks which give the boat a speed of 17 m.h.p.

Rating and Racing of Motor Boats

By G. W. Schaeffer

Secy., South Shore Power Boat Club, Chicago, Ill.

WEEK-END cruising in the waters of Lake Michigan in the immediate vicinity of Chicago is necessarily limited to random trips out into the open lake, as the nearby ports are industrial harbors in which ore and coal docks predominate. These offer no attractions to the motor boatman. The summer resort ports on the east and west coasts are only accessible on extended cruises during the vacation period, usually of two or three weeks' duration. During the remainder of the season, from May 30 to the middle of September, it has been found difficult to schedule events in which the boat owner would take an interest. The formation of a Power Squadron was tried but the monotony of maneuvers offered no real diversion and interest soon lagged and died out entirely. However, the squadron members profited materially by the study of elementary navigation, a prerequisite to squadron membership. To maintain interest it became necessary to devise some form of competition requiring the employment of practical navigation and a knowledge that the power plant was operating close to its maximum efficiency. Various systems of rating and handicapping of many different types of boats of varying speeds had been tried out for racing. All of these failed and resulted in friction, misunderstanding and general abuse of the regatta committee. No one cared to jeopardize his standing among his fellows in the club by assuming the chairmanship of a regatta committee. Bang-and-go-back racing was tried one season but this scheme also failed as there seemed to be no way to prevent resort to all sorts of tricks to win. Our club drifted along in this situation for a number of years with nothing of interest to look forward to except the annual cruise.

Happily, I believe, we have reached a solution of this serious problem as we have succeeded in working out a plan during the season of 1919 in which our members have evinced a keen interest. Other clubs have found themselves in the same situation, no doubt, and believing that our experience may be of interest to other clubs whose experiences have been similar to our own, the following detailed description of our plan of rating and racing motor boats and how it worked out may be of interest.

A regatta committee was appointed with instructions to report a plan of rating and racing motor boats different from any plan heretofore adopted. After several meetings of the committee during the winter of 1919 the unanimous conclusion was reached that the only system fair to all classes of boats was one based on actual performance. In other words, a system which would cause the boat owner to pay the strictest attention to the proper operation of his power plant and to give concentrated attention to navigation and seamanship. It was considered essential that all three of these elements should be developed by boat owners to assure safety to boat and crew when racing or cruising.

For the purpose of determining ratings the boat owner was required to submit to the regatta committee, in writing, his time in seconds over an accurately measured mile course. A chart of this rating course was posted on the club bulletin board. It was required that some one aboard the boat who witnessed the trials certify as to the accuracy of the rating submitted by the boat owner. In the instructions to boat owners it was suggested that each must be his own judge as to the rating turned in to the committee after a series of trials under varying weather and sea conditions. For example, it was pointed out that if a boat ran the mile course at maximum speed in 360 seconds or ten miles an hour, it would not necessarily follow that it could run a 35-mile race at the same speed. To secure an accurate rating the owner would necessarily have to run the trial course a number of times in order accurately to determine the maximum speed in miles per hour he could sustain over a 35-mile course and express that determination in his rating sheet to the regatta committee in seconds per mile. In this connection it may be noted that it was stipulated that no race would be less than 14 miles in length. The committee assumed that any maximum speed that could be safely main-

tained for 14 miles would hold good for 35 miles or more. The committee planned where a race was over a regular sailing course to another port to start the competing boats so that (theoretically) they would finish at approximately the same time, thus: Let us assume the course is 35 miles and the competing boats are of three classes as to speed, i.e., 7, 10 and 14 miles per hour, respectively. We would start the 7-mile boats at 3 P. M. and, based on 514 seconds per mile, it would require 17,990 seconds to make the run, or 4 hours, 59 minutes, 50 seconds, finishing at 7:59:50 P. M.; the 10-mile boats would start at 4:20:50 P. M. and make the run in 12,600 seconds; the 14-mile boats would start at 5:29:55 P. M. and make the run in 8,995 seconds. The boat arriving at the finish nearest its computed time would be the winning boat. Where the course was off shore around fixed objects, such as lighthouse buoys, intake cribs and the like, all competing boats would start simultaneously.

Based on the foregoing conclusions the committee asked itself these questions: What could be more fair? What sort of a system could be devised that would put a skipper on edge to steer his boat and keep her exactly on the course every second of the time he is in the race? It was conceivable to us that the interest of the captain and his crew would be keen to the limit every second to see that the power plant was functioning 100 per cent; that the man at the wheel had his job cut out to the exclusion of everything else; another would perhaps be taking measurements of the engine speed with a revolution counter, and another would be consulting his chart making calculations of his position and whether he was running true to form, etc. We felt that the system above described was designed to produce the maximum of instructive work on the part of the captains and crews and that if the prizes offered were worth working for they had to work for them and work hard.

As a result of our labors the following basic rules were compiled and adopted by our club:

Management

All races and all boats contesting therein shall be under the control and direction of the Regatta Committee. All matters shall be subject to their approval and control and all questions and disputes which may arise shall be decided by them.

Their decision shall be based upon these rules, but as no rule can be devised capable of meeting every incident and accident of sailing, the Regatta Committee will keep in view the ordinary customs of the sea and discourage all attempts to win a race by other means than fair sailing and superior skill. The decision of the Regatta Committee shall be final.

No member of any Regatta Committee shall take part in the decision of a question in which he is directly interested.

Application.

1. The rules shall apply only to boats contesting in a race.
2. Boats shall be amenable to the rules after the preparatory signal has been given.

Ratings.

1. All boats will be rated and all races will be run on the basis of actual performance.

2. For computing ratings each boat owner will be required to submit to the Regatta Committee his time in seconds over a course specified by the Committee. This information will be submitted on a blank form prepared for that purpose.

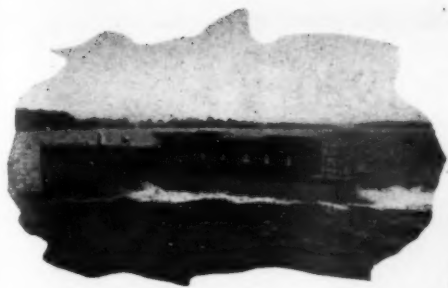
Any boat owner may submit a revised rating at any time within fourteen days before a scheduled race giving his reason therefor. The Committee reserves the right to reject the new rating if the reason given does not meet with its approval.

3. The rating as turned in by the boat owner will be used as a basis for computing his time for the several races by multiplying his time in seconds per mile by the number of miles to be run in each race. The boat finishing nearest its computed time will be No. 1 and will be declared the winner of the race. Place prizes will be awarded on the same basis if any are available.

4. The starting time of each boat will be announced in ample time before each race, the object being to start the boats at such times as to insure their finishing simultaneously.

5. The starting time fixed for each boat must be rigidly

(Continued on page 88)



A day cruiser, plenty of speed and a comfortable cabin provide every convenience for short trips. Sterling engines provide the necessary pep so that no time is lost



This capable runabout Humo is driven along at a very satisfactory speed by its Model E 17-25 h.p. Sterling motor



Roy II. An exceptionally fast runabout, designed and built by Wm. H. Hand, Jr., shown here in an almost perfect planing position. The four-cylinder 90-100 h.p. Sterling installed in her is said to drive her better than 31 m.p.h.

Some Modern Sterling-Powered Craft

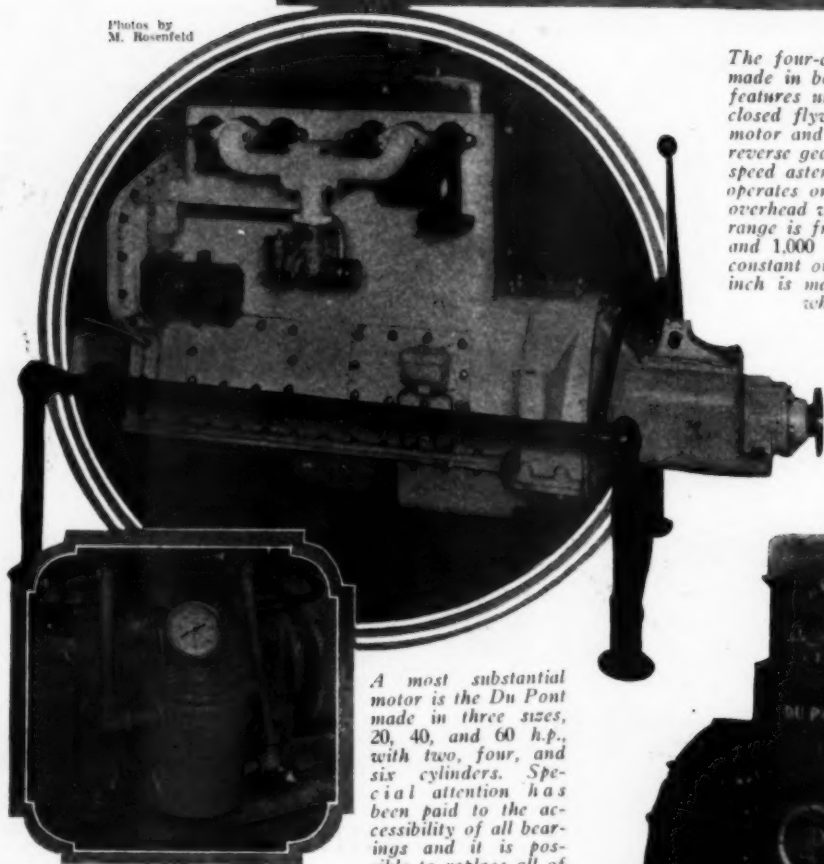
An Assortment of Many Varieties

Elida, a handsome 62-foot cruiser, is equipped with a pair of Model GR six-cylinder Sterlings. This heavy, round-bilge cruiser, owned by W. C. Langley, of New York City, is capable of a speed of 22 to 23 m.p.h. The new dual-valve-in-head Sterlings develop power far in excess of their rated capacity



New Models for 1920

Photos by
M. Rosenfeld



The four-cylinder, four-cycle J. V. B. motor is made in both high- and low-speed types. Some features unusual in the marine field are the enclosed flywheel located at the after end of the motor and dry plate clutch with special J. V. B. reverse gear, which has one speed ahead and one speed astern and a neutral position. The engine operates on any fuel except crude oil, the large overhead valves making this feasible. The speed range is from 600 to 900 for the low-speed type and 1,000 to 1,450 for the high-speed type. A constant oil pressure of eight pounds per square inch is maintained irrespective of the speed at which the engine may be turned.

Oil strainer and gauge as fitted on Lathrop motors, insuring positive pressure circulation of the oil

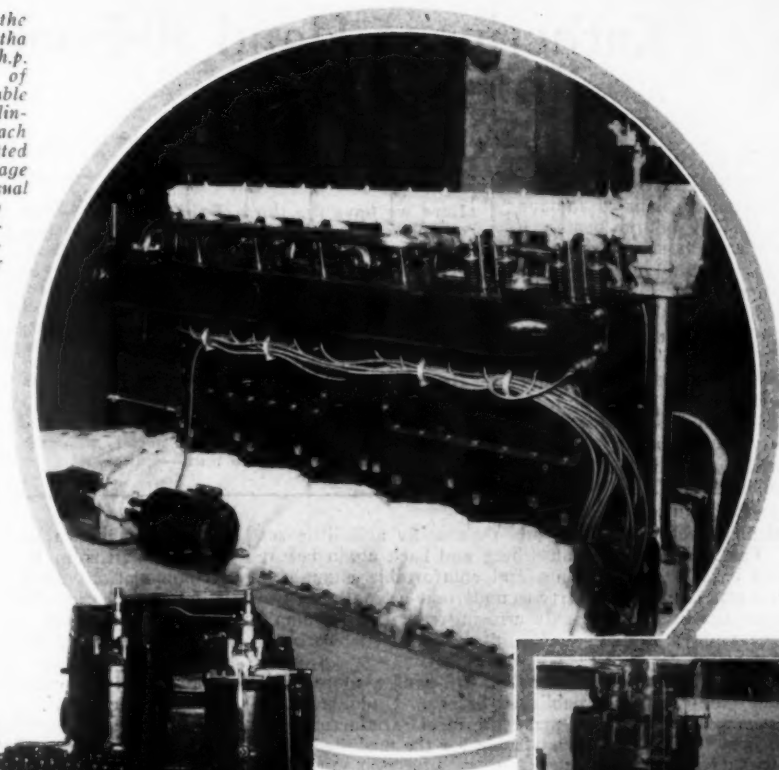
A most substantial motor is the Du Pont made in three sizes, 20, 40, and 60 h.p., with two, four, and six cylinders. Special attention has been paid to the accessibility of all bearings and it is possible to replace all of these in a matter of a few hours



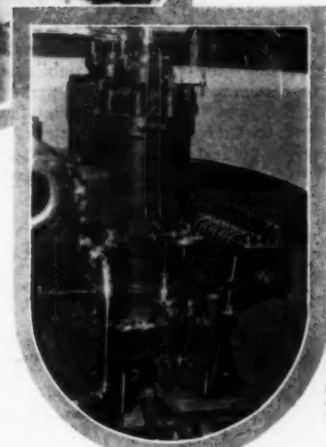
A well-designed little motor is this Gray with $3\frac{1}{2} \times 5$ -inch bore and stroke. It is an entirely enclosed unit plant. An extra large crankshaft of 2-inch diameter is fitted with babbit bearings backed by a bronze shell. A novel fuel heating device to completely vaporize the incoming fuel charge is fitted. In the background can be seen a few of the several varieties of two-cycle motors which the Gray Motor Company produces



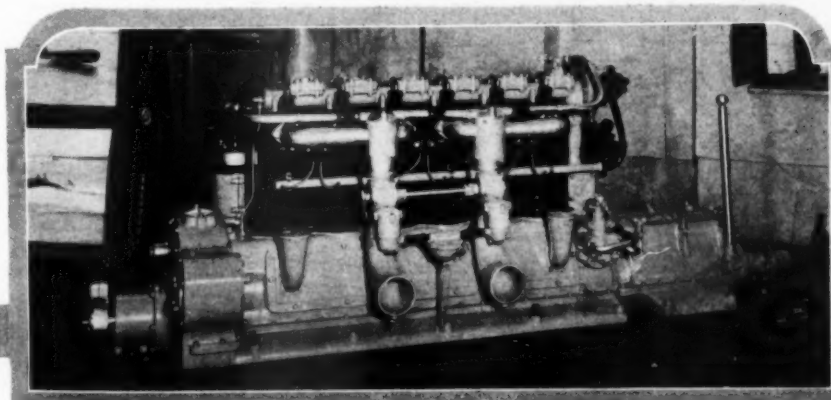
The highest grade engine made in the marine field is this Murray & Tregurtha marine motor, made in 300 and 400 h.p. sizes and constructed throughout of special alloyed steels. They are double inlet and exhaust valves for each cylinder, with individual ports for each valve. A Paragon reverse gear is fitted and the weight complete with storage battery is 2,100 pounds. An unusual feature is a high-tension magneto mounted on an extension of the starting motor shaft. This furnishes current to the main ignition magneto for starting purposes



The latest design in heavy oil motors is the Mianus heavy oil engine made in two cylinder sizes. One of 7½ h.p. and the other of 15 h.p. per cylinder. This engine will run on any oil that burns and use half the quantity of fuel that a gasoline engine would. It positively cannot miss or skip and runs with no more vibration than a steam engine



The high pressure pumps which inject the crude oil fuel into the top of the combustion chamber, and also the force feed lubricator which supplies oil to all bearings



An unusually light-weight motor is the Hall-Scott, which develops 200 h.p. on a bore and stroke of 5x7 inches, with a total weight of only 1,280 pounds. The entire lubrication is by high-pressure pump. Forty to sixty pounds pressure is carried to maintain the oil circulation. This is unusually high for marine motors. The after main gearing is relieved of the load due to the Paragon clutch, this being carried on a special large ball bearing and combined thrust bearing

Katherine, a Hand 30-Foot Cruiser

Designed by Wm. H. Hand, Jr.

(Exclusively for MoToR BoatinG)

CONTINUING the presentation of plans of famous Hand V-bottom boats, we publish this month a complete set of plans and specifications for a 30-foot cruiser, Katherine, which is as complete and able a boat as it is possible to find on the seven seas. The enthusiasm which greeted the appearance of the two Hand V-bottom runabouts published in January and February MoToR BOATING will be redoubled with the publication of the plans of this 30-foot cruiser. This boat is a sizable, well-constructed and thoroughly able little sea boat. Fast enough to get anywhere and back again before the trip becomes monotonous, and comfortable enough to enable a small, congenial party to undertake a lengthy cruise far from the beaten paths, its cruising range being ample for several days' cruising before the item of fuel becomes troublesome.

The construction of this boat is of course more difficult than the runabouts published before. Undoubtedly a professional builder would make the most satisfactory job of this boat. Whether it is advisable for the unskilled amateur to undertake its construction is a serious question. While 30 feet is only twice 15 feet, the amount of work involved is nearer ten times as great. There is decking and

Here we have the third of the series of twelve complete sets of working plans for V-bottom easy-to-build motor boats, which Wm. H. Hand, Jr., is to design for MoToR BoatinG readers in 1920. One set complete with specifications and all information necessary to build the boats will be published in each issue of this magazine during 1920. Many boats are to be built from the plans already published in this series. Mr. Hand himself has agreed to supply full-size plans to any who desire them.

Our design this month is the largest boat of the series published thus far, and a better, snappier little boat will be hard to find.—Editor.

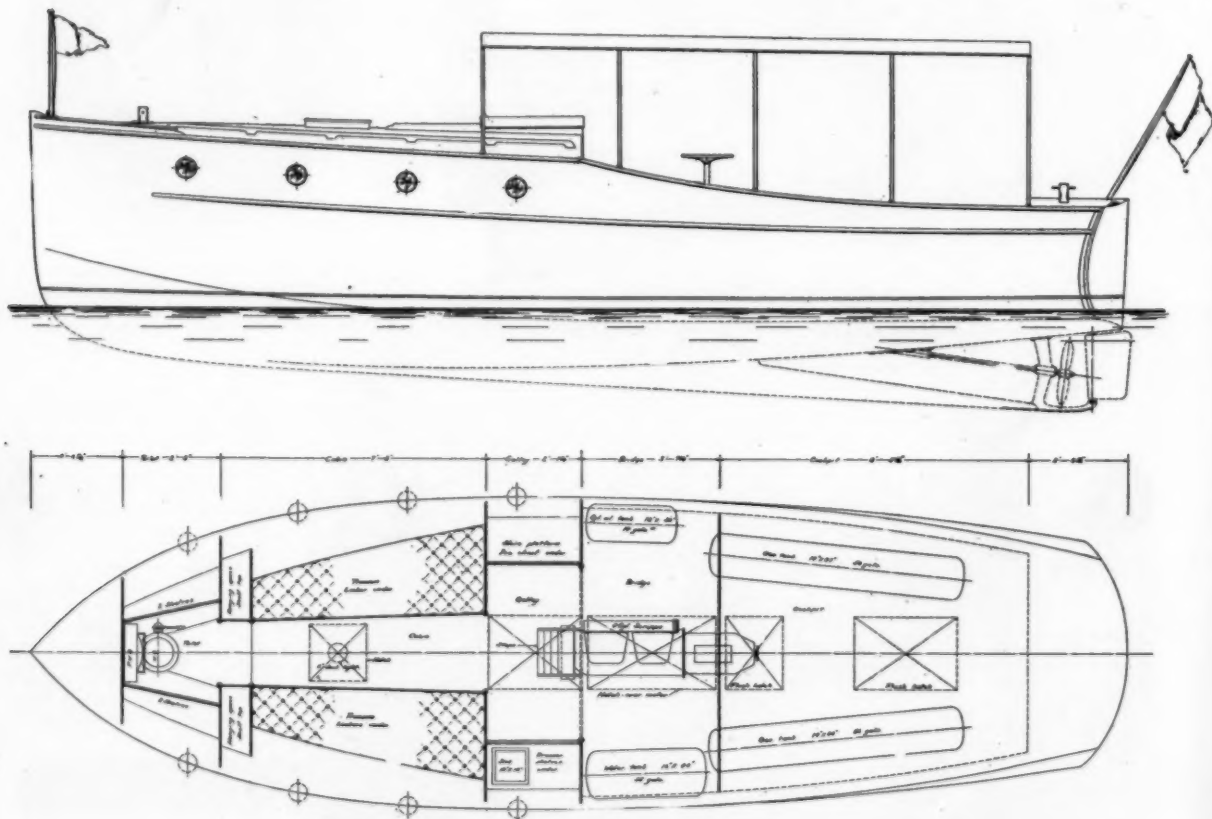
flooring and ceiling and plumbing and finishing and many other items to be done and the amateur to tackle a job of this kind should be quite certain that he is possessed of the requisite skill and ability to see it through.

As our arrangement plan shows this boat is provided with a lavatory in the bow, next are some very useful full length lockers to hang clothes and oil-skins. Everyone will admit that lockers of this type are just the kind they have been wishing for. A ventilating hatch in the deck

above the cabin is a further useful addition for comfort. Two transom berths in the cabin provide comfortable sleeping accommodations for two people, and if necessary swinging backs could be installed to provide berths for two more.

The galley is large and commodious, the platform for the stove is over the refrigerator and all heated air can readily flow out through the companionway hatch. The cabin can be kept cool and comfortable and odors due to cooking are readily disposed of.

The port side provides place for the sink and pantry with dish racks, etc., close by. In the large cockpit ample space is provided for easy wicker chairs which can be left behind if the party is to be a small one. Under the cockpit floor are located a pair of gasoline tanks of a combined



Outboard profile and arrangement plan of Katherine, a 30-foot Hand V-bottom cruiser

Stations	Half Breaths									Heights						Diagonals		
	R Sheer	W.L. 1	W.L. 2	W.L. 3	W.L. 4	W.L. 5	W.L. 6	China	Rabbit	R Sheer	Top of lower plating	China	Fairbody	But-1	But-2	A	B	C
0										7-11-4	6-4-0	4-8-0	1-11-2					
1	2-5-2	1-9-7	1-6-6	1-9-4	1-2-4	0-11-3	0-5-4	1-1-2	0-1-4	7-9-2	6-1-3	3-11-0	1-6-4	3-10-0	7-1-4	2-1-1	1-2-4	0-10-5
2	3-7-0	3-0-6	2-8-7	2-6-2	2-3-6	2-1-3	1-5-1	2-0-3		7-6-7	5-11-1	3-4-4	1-5-2	2-7-4	3-4-2	3-2-7	2-0-7	1-6-5
3	4-0-5	3-9-2	3-6-1	3-4-0	3-1-6	2-11-5	2-8-6	2-9-0		7-4-6	5-9-0	3-0-1	1-4-0	2-0-6	2-8-1	3-10-5	2-8-0	1-11-5
4	4-2-6	4-1-3	3-11-3	3-9-4	3-8-2	3-6-6	3-3-6	3-2-4		7-2-5	5-7-1	2-9-2	1-3-6	1-9-6	2-3-3	4-2-7	3-0-4	2-2-3
5	4-3-0	4-2-6	4-1-7	4-1-0	4-0-3	3-10-6	3-8-0	3-6-1		7-1-1	5-5-3	2-7-7	1-4-3	1-8-7	2-1-4	4-4-5	3-2-4	2-3-2
6	4-1-7			4-1-5	4-1-4	4-0-1	3-9-4	3-7-1		6-5-6	5-3-6	2-7-3	1-5-5	1-7-4	2-1-3		3-2-6	2-2-6
7	3-11-4			4-0-1	4-0-1	3-11-1	3-8-4	3-5-7		6-1-2	5-2-6	2-7-4	1-7-6	1-11-1	2-2-4			
8	3-7-4			3-8-4	3-7-0	3-8-4	3-5-4	3-2-5		5-10-7	5-2-1	2-8-0	1-10-4	2-1-3	2-4-2			
9	3-1-3			3-2-7	3-4-2	3-4-1	3-1-2	2-10-2		5-10-0	5-2-0	2-8-4	2-1-5	2-4-0	2-6-3			
10	2-4-7			2-7-5	2-10-3	2-11-1	2-8-2	2-5-1		5-9-5	5-2-3	2-9-0	2-5-2	2-6-6	2-8-3			

Note—All dimensions given in feet, inches and eights to the outside of planking.

All heights are above base line. Water lines spaced 9" apart. Buttocks 12" apart.

Diagonals, stations and stem per Line Plan. Check rabbet with fairbody line.

Table of offsets for constructing Katherine, a 30-foot Hand V-bottom cruiser

capacity of 112 gallons. Enough fuel to last for twenty-eight or thirty hours continuous running. In addition a 35-gallon water tank and a 14-gallon oil tank are also installed alongside the motor. A Model D-4 Scripps motor of 25-35 h.p. provides power enough to suit all requirements.

It will be necessary to study the drawings carefully and provide for connecting all parts properly. Trimming of ends and fitting of parts had better be left until all parts are assembled.

After the frames are erected in the usual manner and all secured and stayed in place the planking is applied in widths of about 5 inches amidships at the topsides properly tapered toward bow and stern.

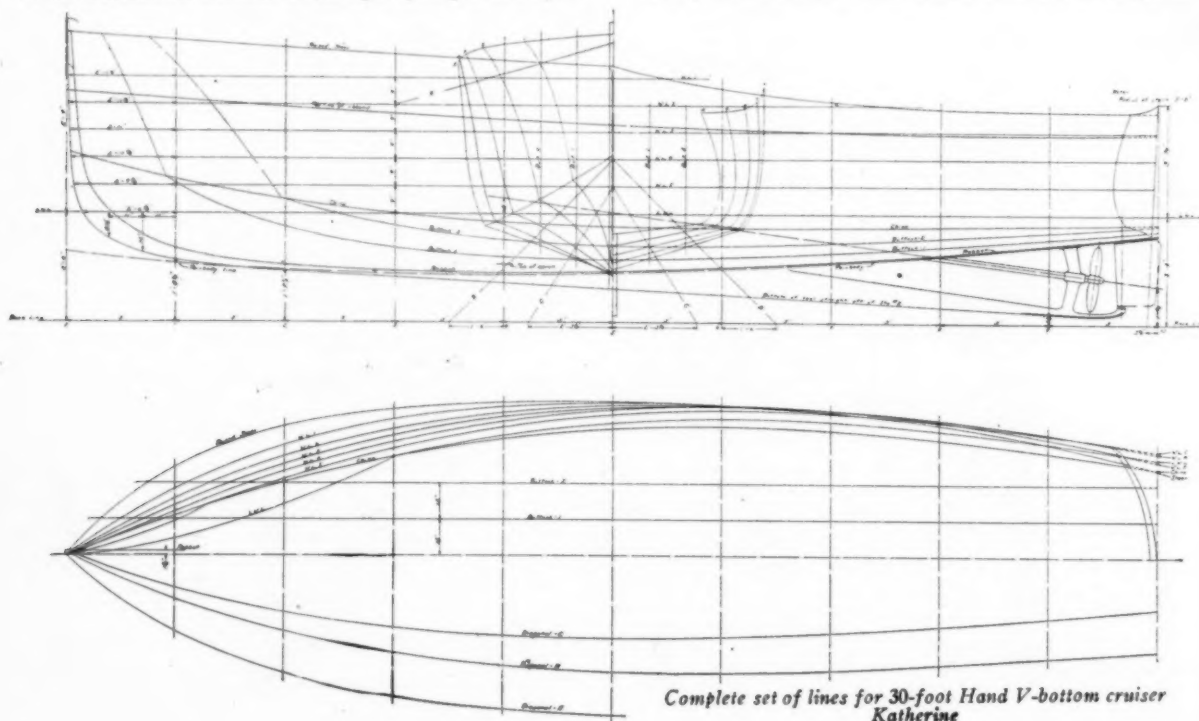
The garboard plank is the most difficult to fit, since it is subjected to the greatest amount of warping or twisting. Select the best plank for this and apply it first and as close to the keel as possible. Trimming it to an exact fit by any of the well-known methods of taking a spiling as the opera-

tion of scribing a plank from the set up frame is often called.

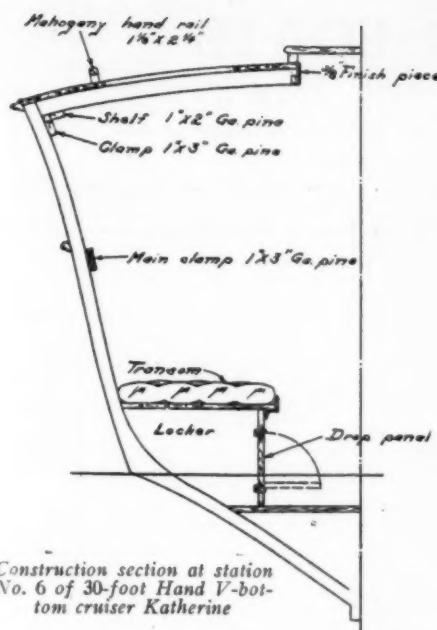
All the other strakes of planking are then put on in the same fashion. After the planking the next operation is the planing and smoothing down with sandpaper after which comes the calking with a strip of wicking or calking cotton about as big around as a pencil before it is forced into the seams. Paint all seams with an old toothbrush with white lead paint and allow it to dry before applying the putty. Next comes the cutting and fitting of deck beams and cockpit floor beams to the engine foundation and other items of this kind. Decking the cabin top with $\frac{3}{4}$ -inch by $2\frac{1}{2}$ -inch white pine strips can then be undertaken and later cover the cabin top with 10-oz. canvas as has been described many times before.

Give the cockpit floor a slight slope aft so that rain water will be readily drawn toward the scuppers. While these are installed in each corner the slope will help to keep the rain flowing faster.

The joiner bulkheads and inside trim are installed as



Complete set of lines for 30-foot Hand V-bottom cruiser Katherine



Construction section at station No. 6 of 30-foot Hand V-bottom cruiser Katherine

shown on the plans and the companionway slide and hatch are completed in turn. Lockers, refrigerator, berths, plumbing, installation of the engine and tanks all come in for their share of attention, and it will take much longer to do than it does to read about it. Care should be exercised and the plans and specifications carefully followed in order to have the finished boat a credit to both its builder and designer.

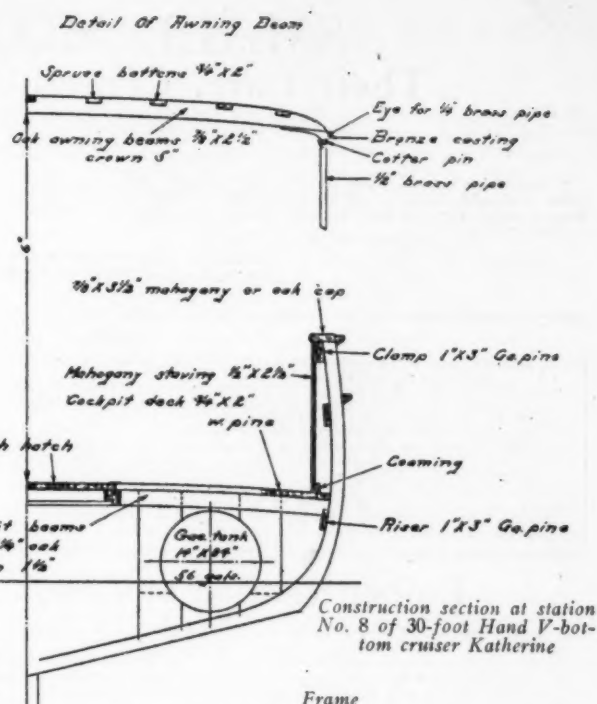
Specifications for 30-Foot V-Bottom Cruiser Katherine

Dimensions

Length, overall, 30 feet; beam, extreme, 8 feet 6 inches; draft, extreme, 2 feet 9 1/2 inches.

Materials

To be strictly first class in every respect, also suitable, and all fastenings to be secure and complete.



Frame

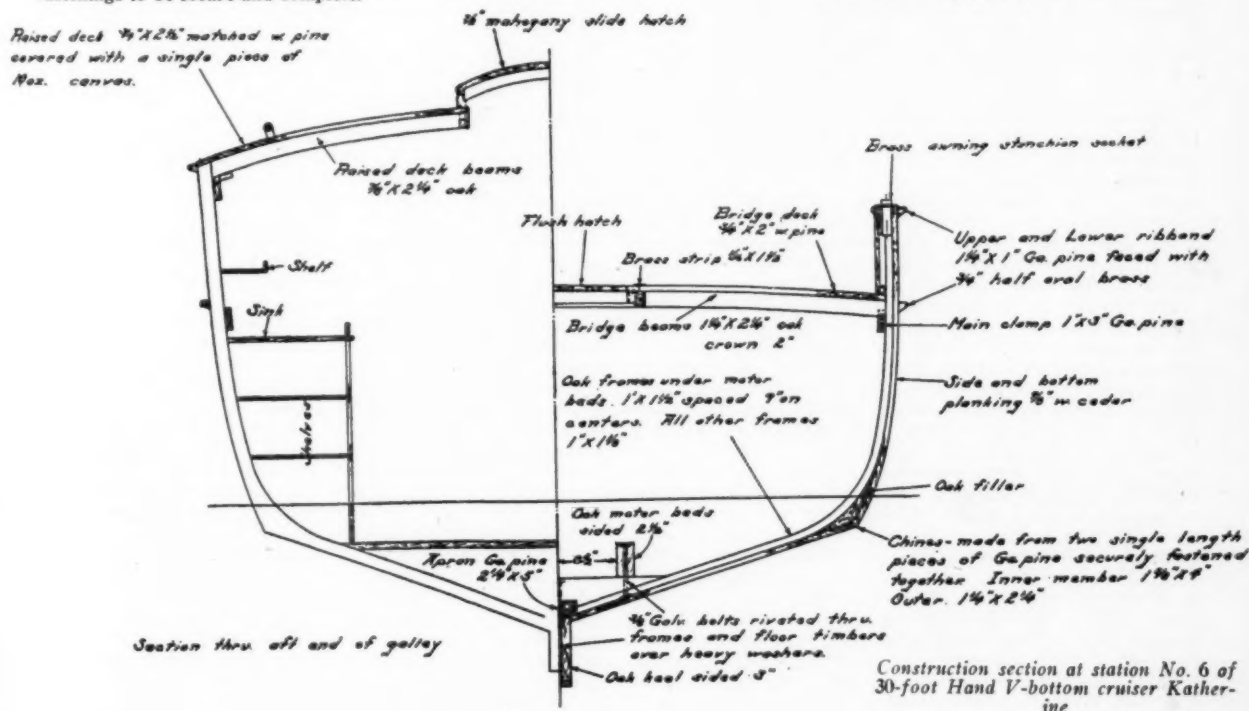
Keel: To be of white oak, sided 3 inches, molded as shown.

Filler: To be of white oak, sided 3 inches, molded as shown, swelled to 3 1/2 inches in way of shaft.

Apron: To be of clear straight grained oak or Georgia pine, 2 1/4 x 5 inches, securely fastened to shoe and filler with 3/8-inch galvanized bolts, through floor timbers under motor and 1/4-inch bolts through all other floors. To be properly beveled to receive garboard stake of planking.

Stem: To be of two pieces of oak or hackmatack scarphed and bolted as indicated. To be rabbetted for planking and

(Continued on page 90)



SMALL MOTOR BOATS

Their Care, Construction, and Equipment

A Monthly Prize Contest Conducted by Motor Boatmen

Questions Submitted for May Prize Contest

1. Describe what you have found to be the most efficient arrangement of sleeping quarters on a small cruiser. Illustrate with drawings a novel form of bed or bunk which you may have devised or improved upon.

Suggested by H. A. H., Baltimore, Md.

2. Discuss the matter of fastenings for the ordinary single plank cruiser. Copper nails, rivetted, brass screws, galvanized screws, galvanized nails, clinched over or not. Holes plugged or puttied. Which is best of the four from the standpoint of economy and efficiency?

Suggested by L. K., New York City.

3. Explain what procedure you would follow in order to determine the proper size of rudder for a given boat.

Suggested by J. W. K., Jersey City, N. J.

Rules for the Prize Contest

ANSWERS to the above questions for the April issue addressed to the Editor of *MoToR BoATINg*, 119 West 40th St., New York, must be (a) in our hands on or before April 1, (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses.

The name will be withheld and initials used.

QUESTIONS for the next contest must reach us on or before April 1. The Editor reserves the right to make such changes and corrections in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions below, any article or articles sold by an advertiser advertising in the current issue of *MoToR BoATINg* of which the advertised price does not exceed \$25, or a credit of \$25 on any article which sells

for more than that amount. There are three prizes—one for each question—but a contestant need send in an answer to only one if he does not care to answer all.

For answers which we print that do not win a prize we pay space rates.

For each of the questions selected for use in the following month's contest, any article or articles sold by an advertiser advertising in this issue of *MoToR BoATINg*, of which the advertised price does not exceed \$5, or a credit of \$5 on any article which sells for more than that amount.

All details connected with the ordering of the prizes selected by the winners must be handled by us. The winners should be particular to specify from which advertisers they desire to have their prizes ordered.

Proper Method of Coming Alongside a Ship at Sea

Know Your Boat and Its Behavior, and Remember to Come Up on the Lee Side of Your Ship

Answers to the Following Prize Question Published in the January Issue

"Describe how you would go alongside a ship or boat which is underway or stopped in open water, telling which side to approach and how to do it, what lines to get out, and how to proceed when you cast off from her."

Good Seamanship a Prime Requisite

(The Prize-Winning Answer.)

THERE are four points to bear in mind when coming alongside a vessel in open water, which are the essence of good seamanship, and beyond these a man must be governed by a knowledge of his boat. The first point to remember is that the larger vessel makes the greater leeway, being more influenced by the wind and sea by reason of her size. Also she provides the better lee in which to work. Conditions might, however, be reversed in case the larger craft was of exceptionally shallow draft and the smaller one a relatively deep and full-bodied type. The second point, to be disregarded only in the most infrequent instances, is that the two vessels should head in the same direction, for reasons which will be obvious later. Thirdly, do not forget that it is the stern of your boat which swings when the helm is put over. You will find, if you watch her, that she pivots at a point somewhere between the bow and the midship section, and although her bow may swing somewhat in the direction you desire to go, the stern will sweep around in the opposite direction to a far greater extent. Finally, the action of the rudder will be the same whether you are going ahead or lying stationary in a current by reason of having a line out to a relatively fixed object. The effect of the rudder will be slightly diminished under these conditions because of the absence of the wake from the propeller.

For the sake of simplicity let us consider the usual case, that of a single-screw boat having a right-hand propeller. And let us assume that it is desired to come alongside a ship lying at anchor in a strong tideway. These conditions are the same as though she had merely slowed or stopped her engines. Unless stress of weather forces you to choose her port side for the sake of the lee afforded, you should come up on her starboard hand. If approaching from her starboard bow and steering an opposite course, commence to round up before you have come abreast of her gangway or other point selected, as the tide will carry you astern. You should then approach her gangway under reduced speed at an angle of between forty-five and thirty degrees. When within heaving distance, get a line from your bow to her and have them carry it well forward of the point where you wish to lie. If you have chocks on either bow, lead it in through your inboard chock, as this will assist to keep your bow off. Now bring your helm amidships and go astern hard for just long enough to stop your way in the water. You will find that this manoeuvre will swing your stern sharply in toward the other vessel's side, bringing your

boat parallel with her. Having made fast as described above and with engines stopped, you can lie alongside indefinitely, using your helm as occasion requires to sheer your boat in or out, and relying on the action of the current to give the steering effect. The same current would be available if the vessel to which you are made fast were making way through the water, but if she were stopped you would need to make use of your own engines to hold your boat off from her side. When casting off, it is only necessary to swing your bow away from her by means of the helm or a boathook before letting go. Then go ahead, keeping your helm amidships until well clear, as otherwise you are in danger of throwing your stern into the vessel's side.

Should you find it necessary to come alongside on the port hand of the vessel in question, the procedure is quite different, and your boat will not handle nearly as well. Instead of coming up at a fairly obtuse angle, you will have to range up from astern on a parallel course, keeping as close to the ship as the sea will permit. Headway should be reduced as much as possible, and a line got out as previously described. Then go astern on the engines only sufficient to stop her dead in the water. Under no circumstances should the engines be kept going after sternway has begun, as the inevitable result will be to throw the stern away from the ship. In a boat that steers unusually well, it is sometimes possible to swing the stern in by throwing the bow out just before going astern and then righting or shifting the helm over with engines stopped after sternway has begun. Once made fast, the boat will lie as well to port of the ship as to starboard. When casting off in this position you have the option of going ahead or astern, as there exists no danger of throwing your stern into the ship, should you see fit to choose the latter method of getting clear. It is, however, advisable to make use of the full power of your engine if going astern with any sea running, in order to avoid having your bow washed in against the ship through not getting clear quickly. This consideration must not be overlooked in installations where the reverse gear is so designed as to materially reduce the effectiveness of the propeller.

The foregoing general principles and practice with one's particular boat will soon render the owner sufficiently skillful to undertake any but the most extraordinary open water transfers of lines or passengers. In the rare cases of left-hand, single-screw outfits the whole matter must be handled in exactly the opposite way, and as there has recently been a discussion in these columns of the handling of twin-screw installations, it is unnecessary to take that up here.

A. H. W., Manhasset, N. Y.

Coming Alongside with a Launch

IT often happens that the operator of a small boat is called upon to run alongside a larger vessel and make a transfer of passengers. As it is often bad weather when this maneuver has to be made, it is worthy of study to be able to do this without damage.

The accompanying diagrams show the operation as it should be accomplished under four different weather conditions. In the diagram A we have the wind and sea on the after quarter of the larger vessel. At first we will consider that the larger vessel is stopped. Naturally the small boat is to come up on the lee side. The best conditions will be found alongside the vessel on the fore side. As soon as the bow of the launch is close enough to cast a line, you should pass one up to the men on the vessel and make it fast on your own forward quarter. Do not make it fast all the way forward. By now backing up with a lee helm you will be able to lie alongside the vessel and parallel with her. A stern line can be passed later to hold you better in position. In case B, you will have to hang on the lee after quarter of the larger boat. In this position you will be able to make the line fast to your own bow.

In case C the wind is dead astern and the conditions will be much worse. Of course if the larger vessel has been stopped for any length of time she will have swung around probably broadside to the breeze. If she is anchored, or only temporarily stopped she may be headed directly as shown. In this case you must choose the best side and run up parallel with the vessel and a short distance away and then reverse, backing slowly down to windward at an angle. As soon as possible get a line out from your own stern. In case D the wind is directly ahead and you can come up on either side, making fast abaft the midship portion of the vessel. The line should lead from your fore quarter. If the boat you are about to board is of the twin-screw type you will have to be very careful to keep far enough forward to escape the propellers. In leaving from a stopped ship the procedure will usually be very simple. You can either back away at an angle until you have room to turn, or else run ahead alongside the steamer until the wind will push you sidewise from her side.

If the larger boat is under way your troubles will be multiplied. You will of must not get near vessel, nor get so

course choose the lee side, but the propellers of the larger far forward that you are in

(Continued on page 62)

Some Daily Experiences in Boarding Vessels

DURING the last ten of fifteen years part of my daily work has called for boarding trans-Atlantic steamships, whether under way or stopped, and in all sorts of weather conditions. Most of the boarding has been from glass-cabin motor launches assigned to the customs and immigration services, as well as from submarine chasers and coast guard tugs. The procedure is about the same, no matter what vessel is employed. I may add that I have never known the glass-cabin launches to break a window when alongside a moving steamship and total damage sustained by these boats—one thirty feet long and the other fifty-five feet long, could be repaired for ten dollars.

There is one precaution, however, that must be observed when closing in with a steamer; that is, keep away from suction caused by the propeller, which tends to drag one's vessel into the wake or swash with sometimes disastrous results. Also, if the ship is steaming ahead watch that her engines are not sent astern, as that upsets calculations. In any event, never wait for an approaching ship at a point she must pass in a narrow channel because the drag of the huge hull has its effect on steering qualities of the small boat and is likely to make her handle in a sluggish or erratic manner.

Therefore, as the ship approaches, say at a speed of eight miles an hour and is, generally speaking, at distance of 300 yards, and your boat 100 yards or so off the bow, close in at a speed that will place you alongside just forward the navigating bridge, whether to port or starboard depends on circumstances and, so far as I have observed, the side approached is immaterial. The watch officers have observed you maneuver, and, possibly, reduce the ship's speed a knot or two if she appears to be moving too fast for the boat. A rope ladder is ordered over, usually just forward the bridge superstructure and the launch pilot, perceiving it snaking down, heads in and lays the launch alongside, fenders out, of course, as steel plates and butts otherwise might give the small craft a serious scraping with the water at all rough.

My experience has been that lines are not necessary when boarding a moving ship from a launch, although a line usually is dropped from the deck. Instead, the launch's motor gauges his speed the ship and, with rudder toward the

the man at with that of other's hull,

(Continued on page 62)

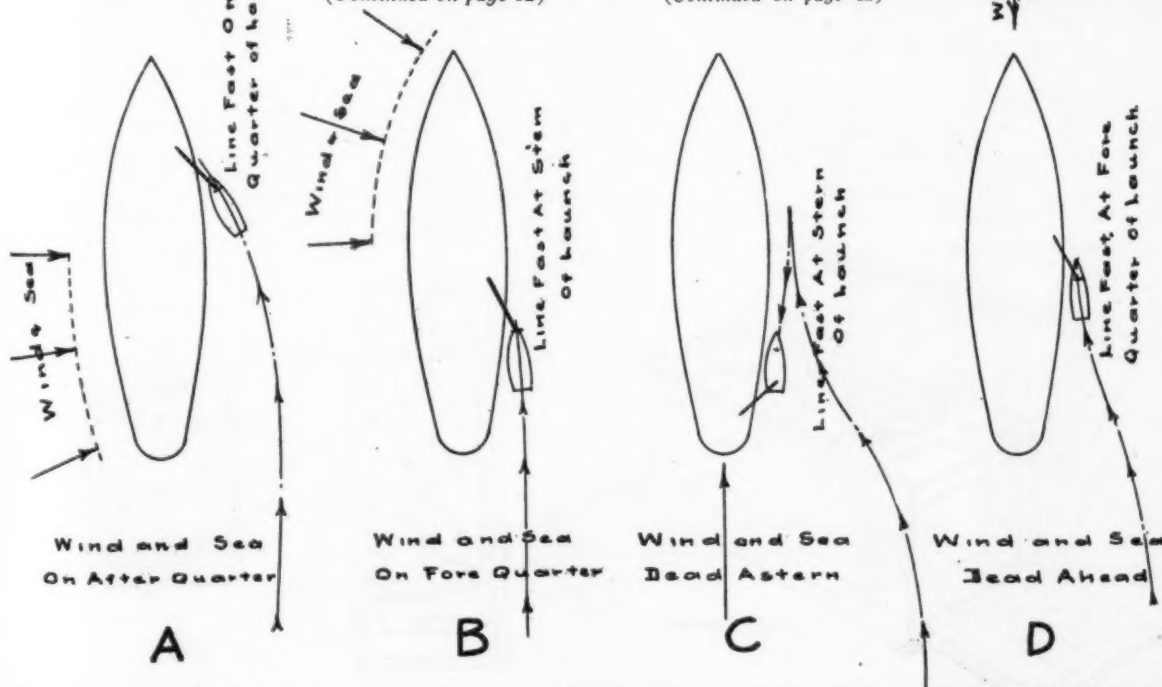
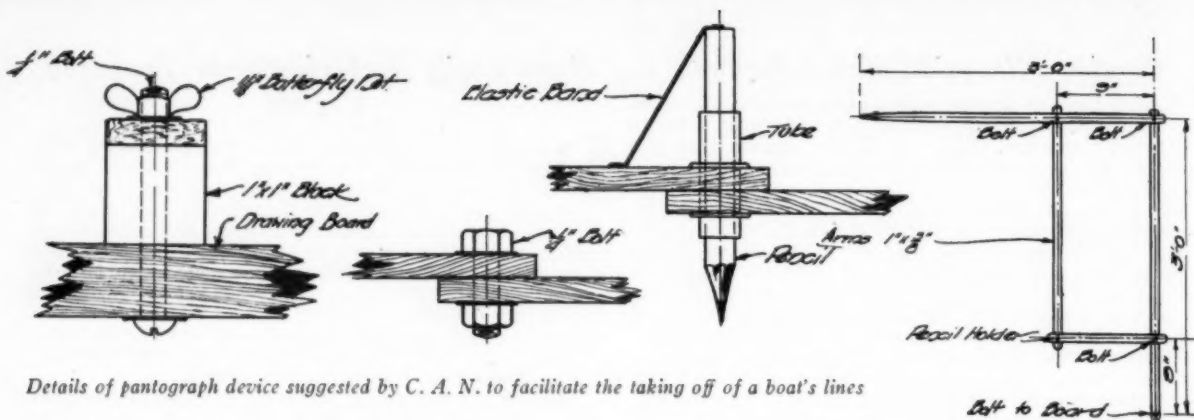


Diagram by G. T. W. illustrating correct methods of approaching a vessel at sea, under varying conditions of wind and weather



Details of pantograph device suggested by C. A. N. to facilitate the taking off of a boat's lines

Practical and Readily Removable Battery and Coil Containers

Numerous Suggestions for Solving This Problem, Particularly as Applied to Open Boats

Answers to the Following Prize Question Published in the January Issue

Describe and illustrate a practical, readily removable container for batteries and coil. One that can be properly, easily, and quickly taken from or placed in position on an open boat if owner so desires

A Simple Wooden Box with Spray-Proof Cover

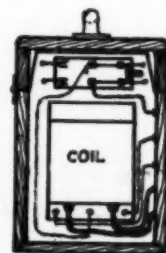
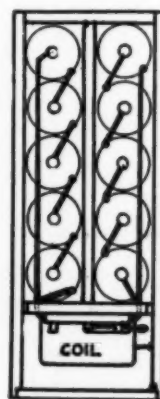
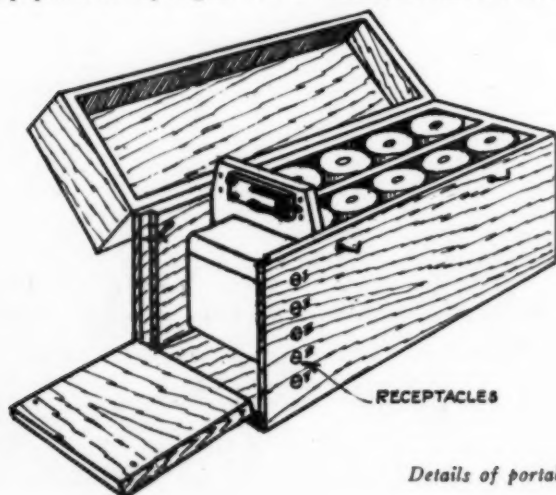
(The Prize-Winning Answer.)

A BOX for the batteries and spark coil of the "little fellow" with a simple single-cylinder motor is a most useful piece of equipment, especially where the boat is kept in an exposed locality with no assurance of prompt bailing or pumping out in bad weather. The removal of the batteries and coil is also excellent protection against use of the boat by "joy-riders" but is no protection against the determined thief. The boat large and pretentious enough to have a multi-cylinder engine should have a water-proof coil and battery built into some locker, the wiring system of such engines being too complex to connect up for each trip. The desirable features of a coil and battery box for the simple motor boat are: The body of the box must be water-tight, the cover must fit so as to be spray-proof, the wiring must be so arranged that when the box is carried all wires will be inside with none trailing along to be stepped on or tripped over, the box must balance well when carried—all batteries must not be in one end of the box—and it must have room for two sets of batteries unless the engine is equipped with a magneto.

The box illustrated in the accompanying sketch incorporates to a large extent the desirable features outlined above. As indicated by the wiring diagram the particular box illustrated is arranged for a single-cylinder jump-spark engine having no magneto and a coil built to operate on four dry cells. The dimensions may be readily changed to suit the electrical equipment of any engine if it is remembered that the ordi-

nary dry cell is $2\frac{1}{2}$ inches in diameter and 6 inches long.

The box should be made of any light sound wood such as cedar or cypress one-half inch thick and should be fastened throughout with brass screws. All joints should be well smeared with white lead and oil before being screwed up in order to make them water-tight. In making a box of this kind it will be found much better to make the entire box and top as one unit a little higher—about a half inch—than the finished box is wanted. The top may then be easily cut off with a sharp rip saw along a line scribed round the box at the proper height and in this way a box and top that really fit can be obtained by planing the cut edges of the box and top until they are the proper height. The writer learned this "wrinkle" from an expert cabinet maker and can vouch for its being a great time saver. A strip of $\frac{1}{4}$ -inch wood, 1 inch wide should next be fastened round the inner edge of the box to act as a coaming for the top to fit down over and make the joint water-tight. The $\frac{3}{8}$ -inch partitions which divide the box into three compartments should be fastened into place with screws from the outside of the box after all holes necessary for wiring have been bored in them. Holes for the primary and secondary wiring to pass from the central compartment to the engine should next be bored with a slant upward into the box to prevent water from running down the wiring into the coil chamber; and then the box should be finished to match the interior of the boat and should receive two coats of spar varnish inside and out over any paint that may be required. The strap which serves both as a handle and fastener for the box may be put on after the final coat of varnish at the same time that the hinges are put in place. The hinges should go on the front of the box as shown so that it may be opened when backed up against a



Details of portable battery box and coil container as designed by L. R. K.

bulkhead to which it will probably be attached with metal carriers like those of an ordinary side light.

The installation of a "kick switch," together with the batteries, coil, and wiring, completes the outfit. The coil should be securely fastened to the back of the box with the vibrator up and all primary wiring should be fastened in place with little wooden cleats. The high-tension cable should be attached to nothing inside the box but its terminal on the coil and should be provided with a spark-plug hat or other device to keep spray off the plug. The batteries should be either wedged in place with strips of wood which will keep them from touching each other or should be imbedded in paraffin wax. The writer prefers this latter procedure as, if it is carefully done without serious heating of the batteries, they will last much longer than if exposed to moisture and inevitable slight short circuits. The paraffin should be melted in some form of double boiler and about $\frac{1}{8}$ -inch of the wax poured on the bottom of the box before the batteries are installed and wired up. After the cells are in place and wired properly wax should be poured round them about $\frac{1}{2}$ inch or so over the tops of the cells. If all the wax is put in at one pouring or if insufficient time is allowed between pourings for the box and batteries to cool off the cells will be injured by the heat. A couple of sets of batteries arranged in a box like this and sealed up in wax will last an entire season even if given heavy use in the warm damp climate of the semi-tropics.

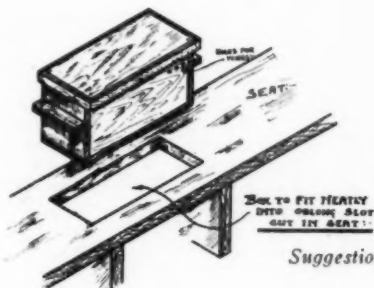
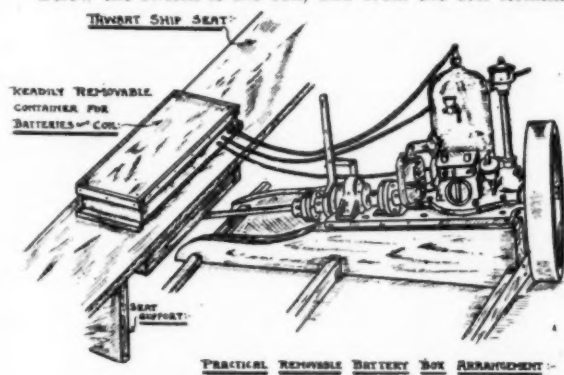
W. M. A., Philadelphia, Pa.

A Convenient, Portable Battery Box

A CONVENIENT, portable box for holding the dry cells and coil can readily be made by a handy boatman along the lines of the illustration herewith, of which only a brief description need be given.

The battery compartment is divided into two parts, each holding a series of five dry cells. At the end of this compartment is a partition extending up into the lid. Mounted on it near the top is a double-pole, double-throw switch, to each side of which the wires from one set of cells is connected and by this means the current can be taken from either set of cells or cut off entirely. It is well to connect the wires to this switch so that the polarity will be changed with each reversal, tending to wear the contact points of the coil evenly.

Below the switch is the coil, and from the coil terminals



Suggestion by C. E. B. allows the top of battery box to be used as part of thwart

run wires to a series of receptacles mounted on the side of the box, taking special care with the secondary wires. The wires from the engine are left permanently in the boat, and each wire terminates at a convenient point with a plug properly marked for ready insertion in the right socket on the box. All you need do is to put the box in the seat, slip the plugs into it, throw the switch to one side and you are ready. For quick, running use, another switch at some convenient point mounted on the boat with the permanent wiring will be a convenience. This is only a single-pole switch.

As single-pole connectors may not readily be secured, use the regular double-pole connectors, splitting the wire (it should be twisted, stranded wire), soldering half to each pole. This will give a double contact to each wire.

The end of the box in the coil compartment is hinged, giving full access to it. The lid is of the hollow construction with two good hinges, and two good catches on the sides, and a comfortable handle on top. Give the entire box inside a coat of hot paraffin or other insulating, damp-proof paint, and put small strips along the floor of the battery compartments so that the cells will be about $\frac{1}{4}$ -inch above the bottom for air circulation.

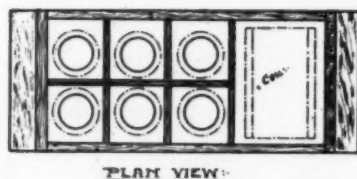
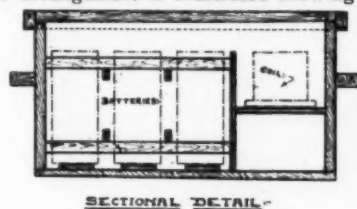
No dimensions are given, and this description is necessarily general, but it will give the idea and the builder can supply the rest to suit his coil and own ideas of battery and wiring connection. It may be preferable in some cases to carry all the wires in the box, connecting them to the engine each time.

L. R. K., Philadelphia, Pa.

A Compact Battery Holder

A SMALL but rather important detail of equipment for use aboard the open boat is a proper container in which to keep the dry batteries and coil. A neat-appearing box of some sort, properly arranged in a manner that will make the entire ignition outfit quite accessible or readily removable if the owner so desires is the kind to be favored.

In many of the present-day small open boats the cockpit is arranged with a seat which runs crosswise just at the back end of the motor. The man who operates the craft generally sits at one end of this cross seat and as a rule the center portion immediately over the propeller shaft is seldom used. By referring to the accompanying sketches a neat and compact battery holder arrangement is illustrated showing whereby



this seldom used seating space can be used to advantage. Here it will be seen that a neat oblong slot in the center portion of the seat has been cut out. The slot is of such length and width as to just allow easy entrance of a box that will snugly hold the batteries and coil.

By again referring to the drawings the simple construction of the box and the manner in which it is held in position will be readily noted. Any one can make the box quite easily after the manner indicated and the dimensions or size of same will depend entirely on the number of batteries and the size of coil used.

The batteries are each separated one from the other by thin strips of wood and the coil is supported on a shelf at the end as shown. The cleats, one at each end of the box, serve to keep the outfit in position when installed in the boat and also served as handles when removing same and carrying to the boat-house locker. The wires are all led from separate holes bored in the front side of the box close to the cover. Each wire should have just enough "sag" to prevent water from running back towards the box should they ever become wet.

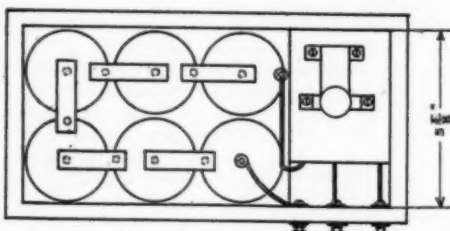
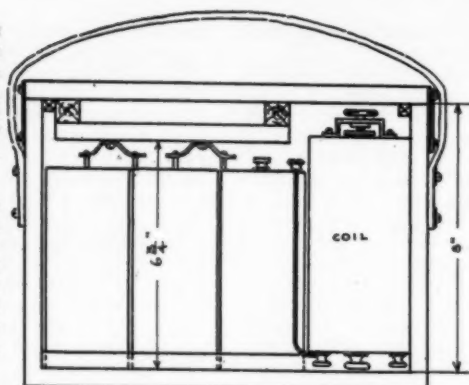
By following out the scheme and details of construction as illustrated you can without difficulty make and install this practical outfit yourself. If by chance your boat is not equipped with a cross seat just aft of the motor a simple holder for the box can be made by fastening two vertical supports to the floor and nailing a horizontal piece (with oblong slot) across these pieces.

Such an arrangement has been employed by the writer for a number of years and has given complete satisfaction in every way and without resorting to filling in the space about the batteries with either paraffin or other material.

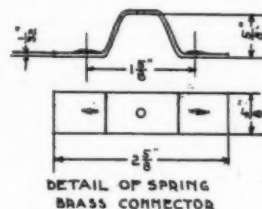
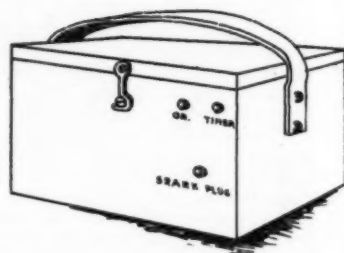
C. E. B., Fall River, Mass.

Sheet Metal Battery and Coil Container

THE sketch shows a box made of galvanized iron, about No. 22 gauge, just large enough to hold the number of dry cells required (five shown here) and the coil or coils. The box could be made of hardwood but would be more bulky and harder to keep tight. Three sides are folded up from one sheet of iron, the top side being left



Spring brass connectors used by E. J. S. to insure good contact at all times



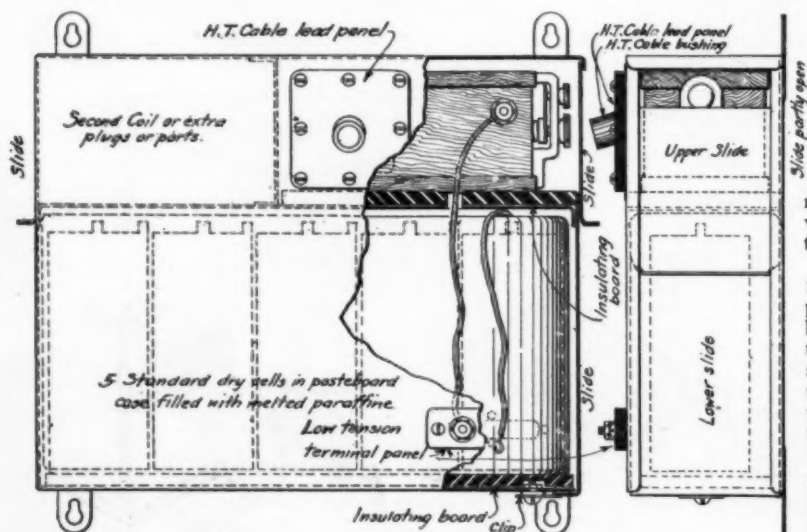
long enough to turn down about half an inch over the ends. A partition of the same material is soldered in as shown, forming a shelf for the coil to rest on, allowing room for sheets of insulation under and around the coil. A vertical partition may be fitted back of the coil as shown, if desired. Then the front sheet has its edges turned over about a quarter of an inch and an opening about three inches square cut opposite the high tension terminal of the coil. An insulating panel of bakelite or similar material, which can be obtained from a dealer in radio goods, is cut and fastened over the opening with brass bolts and nuts with a gasket in between to keep out the water. Hard fiber is not suitable insulating material to use around an open boat as it is affected by water. It is well to surround the high tension cable, as it leads through this panel from the coil, with some sort of a short bushing of insulating material, in which it makes a snug fit. Perhaps some special fitting, suitable for the purpose, could also be obtained at the radio outfitter's. A good idea would be to have this bushing slope down so that water would not be so apt to run down the cable and onto the panel; at any rate, take good care to have first-rate insulation around this cable and keep it well away from the metal case at all points.

The construction of some coils might make it necessary to lead the cable out of the end of the case instead of the side. A similar but smaller panel is fitted to the side or bottom of the case and contains the timer and ground terminals and it would be well to fit an insulating block over these terminals, after the wires are in place, to prevent accidental short circuit and keep out the water.

When the work is completed on the front of the case it is soldered to the part already made, leaving one end open but with the edges turned over except at the bottom; this is left free for the slides. Rivet or solder four keyhole clips to the corners of the case as shown; these fit down over large screws and hold the case securely, yet it may be instantly removed after disconnecting the wires.

Bend up another case out of stiff cardboard or pasteboard forming a box to hold the dry cells with about a quarter of an inch to spare around the sides and bottom. Glue this box together, cut and

(Continued on page 58)



Galvanized sheet iron container designed by H. H. P.

How to Take the Lines from the Actual Boat

An Explanation of Some Methods of Doing This Otherwise Difficult Piece of Work

Answers to the Following Prize Question Published in the January Issue

"Describe and illustrate with sketches the most simple and accurate method to obtain a motor boat's lines from the actual boat"

Taking Off the Lines

(The Prize-Winning Answer.)

THERE are various methods of taking the lines off a boat. In my mind the following method is about the simplest. It entails a little work in the beginning, by having to make the pantograph, but I think anyone taking lines off by this method will find it very accurate and will be amply repaid for the work.

In going about taking the lines off, a base line must be struck on the keel, parallel to the waterline, on this line the sections must be divided up. Any number of equal stations will do. A line is then struck on deck from bow to stern, mark the stations on this line also. Square them out to the side of the boat. Take very good care that the stations on the deck line come square above those on the base line. The station lines are chalked on the skin of the boat.

A drawing board with pantograph attached is then placed in a vertical position, opposite the section to be traced, and at right angles to the fore-and-aft centerline, at a distance to enable the pantograph to reach all parts of the section. The point "D" on the pantograph is then moved down the chalk line on the boat, and the pencil in the pantograph reproducing a reduced copy of the section on the board. All the important points, such as the top of the gunwale, bottom of keel, rabbet line, base line and waterline, should be marked by a dot on the section which is done by pressing the top of the pencil when the point "D" is opposite these spots on the hull. The half-breadth on deck and the half-breadth on keel should be noted for each section.

In making the drawing of the lines of the boat, a sheet of tracing paper should be tacked on a drawing board and marked with a centerline and a base line. Then mark off the half-breadth of the deck and keel, taking the sections obtained with the pantograph, slip them under the tracing paper, placing them so as the top of the gunwale comes on your half-breadth spot, and see that base line dot checks up with base line on the tracing paper. Trace all of the sections in this manner and usual way of making a set of lines. Drawing your sheer plan and your half-breadth plan, taking your heights and breadths from the sections.

The pantograph shown in the sketch will make sections on a scale of 3 inches 1 foot, making the sketch one quarter of the size of the boat.

C. A. N., New York City.

Uses Offset Rule

VERY few boatmen actually know the lines of their boats, yet there is a great deal to be had from a fairly accurate set of lines which few boatmen realize. From them can be determined the stability, speed for a given horsepower, etc. How often does the person tinged with the desire for making alteration come to grief by not knowing that certain things will not fit in their proposed places. If a set of lines were handy all of these facts could be foreseen and many serious errors avoided. Fortunately, boatmen interested in their ship's lines are artists enough to be

able to sketch a rough profile of their boat when high and dry. Fig. 1 shows the profile of the boat chosen for this discussion. The first thing to do in order to obtain a fairly accurate set of lines is to make sure that the ground over which your boat rests in her cradle is perfectly level, very few square feet need be leveled off for the average size boat if the ground is not exactly level. By means of plumb-bobs the load waterline of your boat may be leveled both longitudinally and laterally. This is quite important and easy to obtain by shifting the cradle wedges. The next thing is to stretch a string along the ground from bow to stern along the centerline of the keel, and peg string at both ends. Knowing the approximate length of the waterline, divide it into approximately ten parts, each section being a whole number of feet. The division lines are called stations and are numbered from the right, thus in Fig. 1 there are nine stations.

Lettering the points of intersection of stations through deck line, rabbet to keel shoe, will make it easy to follow.

Let us suppose that in the boat of Fig. 1 we found that the length of the waterline was 34 feet. Thus we would utilize stations four feet apart, that is the distance from one to two is four feet and similarly for the other sections. The line G-G represents the ground and the heights of the rabbet points, m, n, o, p, s, t and n, and also keel points m', n', o', p', s', t', and n' can be assured by means of a small plumb-bob and a yardstick measure, also thickness of keel. The points just determined in their simplest manner will avoid service trouble in determining the lines.

In order to determine the lines a simple device, shown in Fig. 3, should be constructed. The base being made of $\frac{3}{4}$ -inch wood to which a smooth upright plank is attached by screws through the base. The length of the vertical plank is determined by the highest point of the deck sheer. Bore a hole near the base and run a slot, about $\frac{1}{2}$ inch wide, along for about four feet and suspend plumb-bob as shown. Next make slider to receive both plumb-stake and yardstick, as shown in sketch. The whole device can be made for about \$1.50, the calibration of the plumb-stake being handmade and the zero of the scale being at the bottom of the base.

All is in readiness now and we may proceed to measure

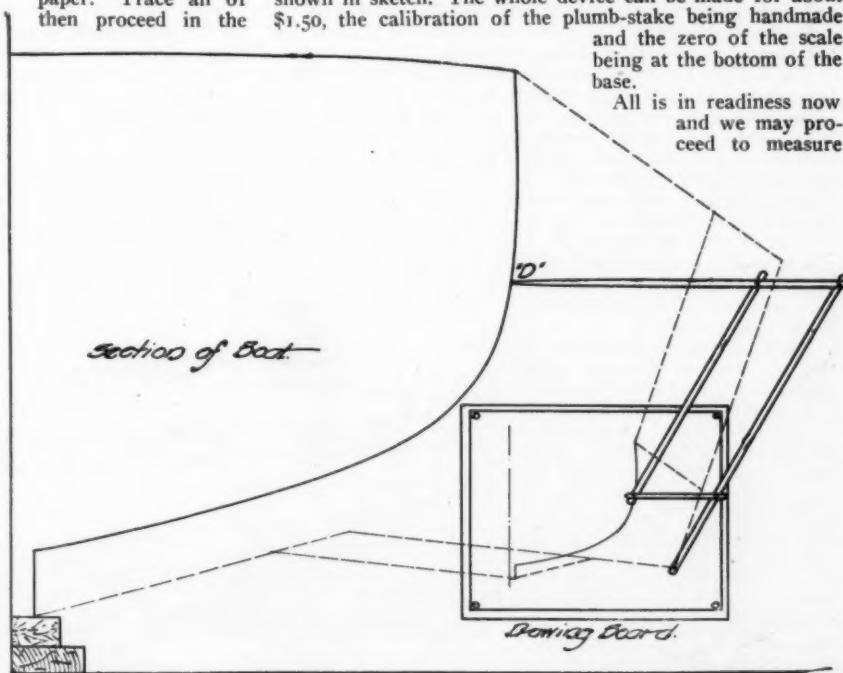
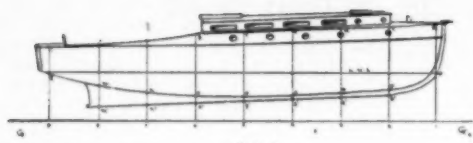


Diagram illustrating the application of the pantograph to the taking off of lines as devised by C. A. N.



up our boat. Let us suppose that we are determining the line of station four. First we would locate the base of our device so that the scale face of our plumb-stake is on and along station 4, secondly that the plumb-stake is vertical by means of the plumb-bob, and thirdly that the point *e* on the deck line is tangent to the scale edge. Measure the distance from the pegged string to the scale edge by means of a steel tape; this gives us measurement *e*, shown at station 4, and locates the point *e* for us by recording the reading of the scale at this point. If now we shift the slider so that the upper edge of the yard stick is 6 inches below *e* and the yard stick reading closer to the center line, touches the hull we have located the point *e*¹ by reading the yard stick in this position, for we know that *e*¹ is 6 inches below *e* and the yard-stick reading closer to the center line. Determining four or five such points determines the curve or line at this station very accurately and making similar measurements at the other stations we can lay out our ship's lines as shown in Fig. 4. The keel and rabbet points have been pre-determined from the profile scheme and this avoids the enormous errors of tangent points. All of the points shown in the profile have been accurately measured except the stem, the point can be determined by a plumb-bob overhang measurement from point *a*, and then superposed plumb-stake measurements to determine the curvature.

C. W. N., N. Y. C.

Laying Down the Lines from a Hull

THE problem of laying down the lines of a hull which is already built is a very different one from working from drawings. It is not necessarily a difficult job but requires accuracy and careful work.

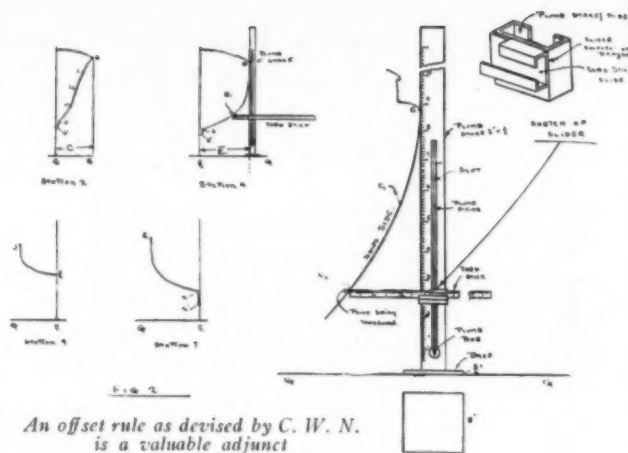
The hull to be reproduced should first be hauled onto a level floor or, if this is not possible, a platform about a foot wider than half the beam of the hull and about two feet longer than the overall length, should be built of 3/4-inch boards, securely battened together and placed level under the starboard half of the hull.

The hull also should be blocked up until the load water line is level and the center line is plumb.

It must now be determined where the molds should be placed and how many used. If the fore and aft lines are easy, fewer molds will be needed than if there are quick or reverse curves. In any case an extra mold will be advisable at the bow and stern.

Mark off the mold stations on the platform or floor at right angles to the keel and also on the side of the hull up to the sheer. To do this locate several points on the side of the hull by dropping a plumb-bob to the mold station on the floor or platform and mark through these points with chalk using a batten.

It will be necessary to use other water lines above and below the load water line. To do this make a pedestal as shown in the illustration. The base should be square and smooth and the post set on it and braced exactly square with the base. Provide an extension to be clamped onto the post at



An offset rule as devised by C. W. N. is a valuable adjunct

various heights. The top of this piece may be beveled off as shown for convenience in marking.

This pedestal is moved from one station to another with the base set on the platform or floor and the top edge will locate the height of any water line to which it is adjusted.

Mark the intersection of each water line with stem, stern post and rabbet or transom and each mold and then transfer them to the platform by dropping a plumb-bob from each intersection to the corresponding point below.

Each water line should be transferred separately to avoid confusion and when all points of one line have been located, the line may be faired up with a continuous length of battens. The sheer line should be taken off in the same way and, if there is a cabin, the deck sheer.

Tumbled home sections will have to be taken off with templates of cardboard.

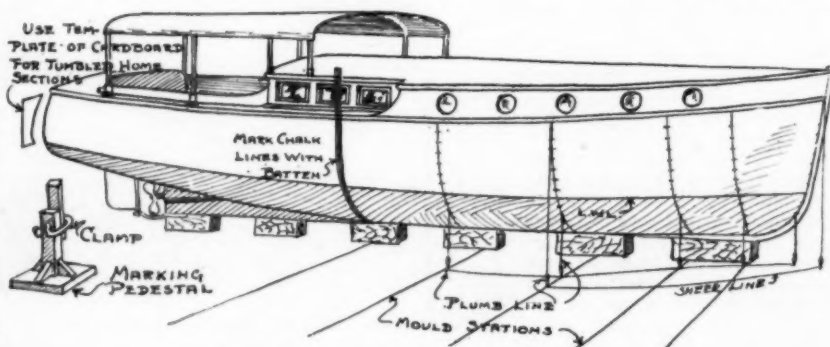
Now lay out a base line the same as if working from plans. It will next be necessary to take off the distances at each mold bow and stern between the platform and the rabbet line in the keel. These measurements will determine the distances which the mold sections should be placed above the base line and also the profile of the keel.

Now draw the various water line heights across the half breadth at right angles to the keel or center line, and project the points in the half breadths at the various mold stations to the corresponding water line. A batten sprung through these points will give you your body plan sections or lines and the sheer heights may be taken off the hull with a measuring stick and transferred to the body lines. Now it is only necessary to lay out the deck line and diagonals which needs no explanation and the body plan is complete.

With the half breadths and body plan the profile or sheer plan may be easily laid out in the usual way.

The above method, I believe, will give more accurate results than would be possible by any other means, as it enables one to correct mistakes as soon as they are observed, as each line is faired up separately. It does require accuracy, however, but with accuracy it is possible to reproduce any type of hull almost exactly.

R. W. H., Springfield, Mass.



R. W. H. uses plumb-bobs for taking off lines

Starting Correctly to Build

X—General Notes on Construction, and Sail Plans for a Twenty-Foot Auxiliary Cruiser

By William Atkin

IT will be remembered by those who have read "Starting Correctly to Build" during the last nine months, that in the issue of September, 1919, the lines appeared (they were marked Figure XXV) of a 20-footer.

This little boat was designed and built almost seven years ago, and as she is still sailing in and out of the ports of the Sound and now and then stops in at the landings along the Hudson, she may be considered a success. Let me say though that although the lines are of this very boat, by the way her name was Elsa, I have made just those changes in her constructive and general arrangement which I feel will produce an even more useful kind of craft.

Now it seems to me that the development of the motor boat has led all of us away from the idea that a boat after all should be a real boat: it strikes me that we all lean too

boat, but such comforts as I do have I like to feel belong aboard a boat.

I am going to begin with this improved Elsa—I shall call her Elsa II—by having a motor boat which will sail. Not because I am doubtful of the reliability of gasoline motors, but rather because I want a mast that is a real boat mast, and not a so-called military mast. I don't like this latter variety of top-hamper. Signal mast seems a better name for the type if it must be used aboard a boat.

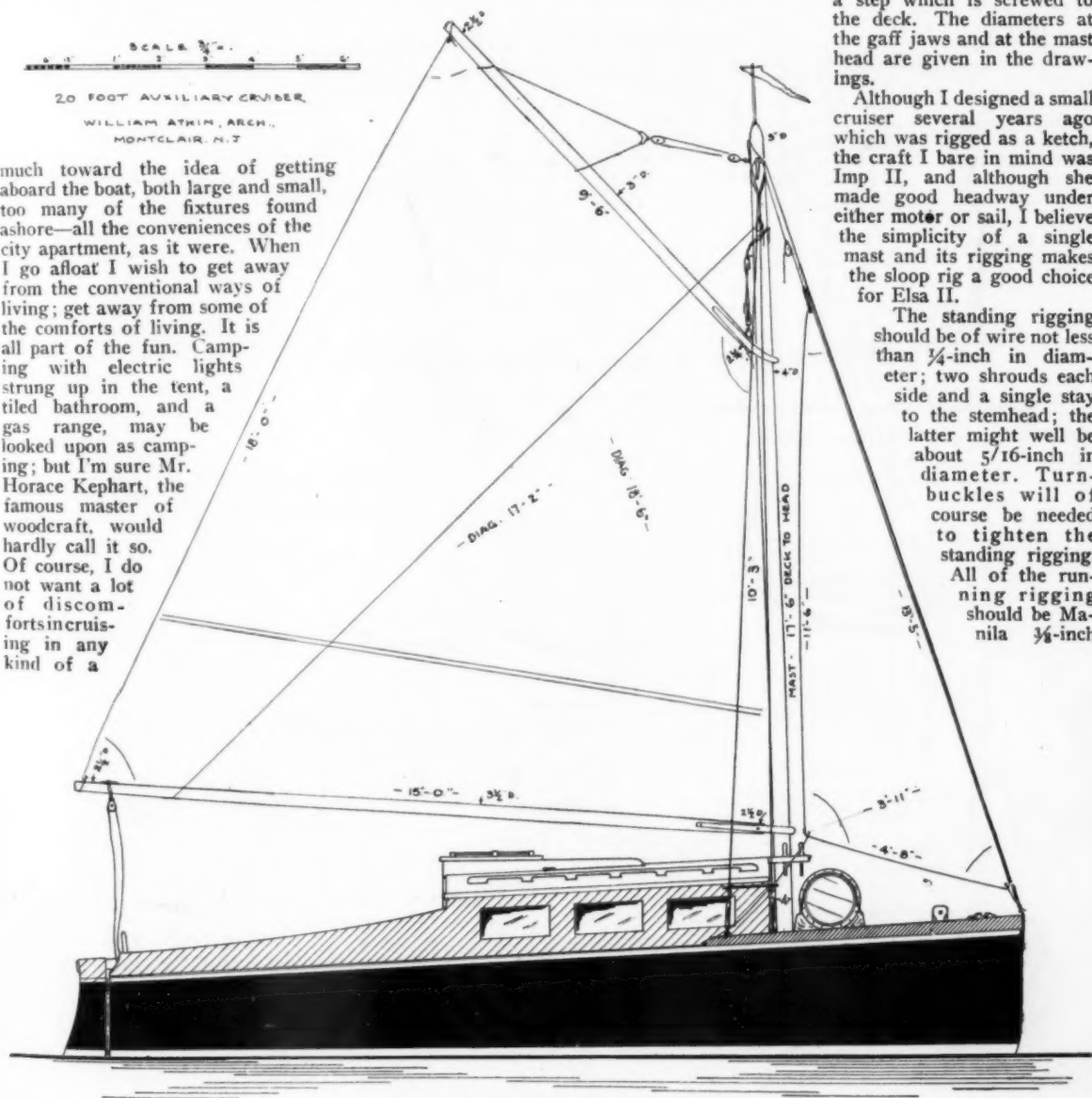
Since I have mentioned the rig of Elsa II, I may as well describe it. The mast should be of spruce 4 inches in diameter and 17 feet, 6 inches long from deck to head. Its stepping is accomplished by building into the cabin house roof a doubling which by extending forward forms a mast bench 18 inches or so above the deck. The heel of the mast fits into a step which is screwed to the deck. The diameters at the gaff jaws and at the mast head are given in the drawings.

Although I designed a small cruiser several years ago which was rigged as a ketch, the craft I bare in mind was Imp II, and although she made good headway under either motor or sail, I believe the simplicity of a single mast and its rigging makes the sloop rig a good choice for Elsa II.

The standing rigging should be of wire not less than $\frac{1}{4}$ -inch in diameter; two shrouds each side and a single stay to the stemhead; the latter might well be about $\frac{5}{16}$ -inch in diameter. Turnbuckles will of course be needed to tighten the standing rigging.

All of the running rigging should be Manila $\frac{3}{8}$ -inch

much toward the idea of getting aboard the boat, both large and small, too many of the fixtures found ashore—all the conveniences of the city apartment, as it were. When I go afloat I wish to get away from the conventional ways of living; get away from some of the comforts of living. It is all part of the fun. Camping with electric lights strung up in the tent, a tiled bathroom, and a gas range, may be looked upon as camping; but I'm sure Mr. Horace Kephart, the famous master of woodcraft, would hardly call it so. Of course, I do not want a lot of discomforts in cruising in any kind of a



A complete design of a 20-foot auxiliary

The boom and gaff like the mast should be made of spruce; similar in dimensions to the ones shown in the drawings. The sail area totals 176 square feet; 150 square feet of this being in the mainsail and 26 square feet in the staysail. While this is not a large spread it is ample for this kind of a boat and will suffice to handle the craft quite independently of the motor—the duck for the sails should be No. 12.

I should recommend the installation of a medium-duty or heavy-duty single-cylinder two-cycle motor as the type motor best suited for this particular craft. It may seem old-fashioned to select such a machine but I am sure that considering initial cost, maintenance and simplicity, such a motor is about right—and for reliability, where is any kind of machine that can approach these?

Rather than a reverse gear and clutch I should use some one of the better known reversing propeller outfits. The blades of these are practically as efficient as those of a solid wheel. There is the disadvantage of a sliding shaft in some types, but I have found that if some good grade of graphite packing is used this is a point hardly worth considering.

Engine beds I have covered in one of the earlier issues of

A thing which I am much interested in is mufflers and the engine exhaust line. These are both always troublesome items and it is seldom that one sees an entirely satisfactory installation. There is a certain kind of muffler made which is spherical in shape. It is so arranged that two exits for exhaust gases may be provided, one each side of the sphere. The exhaust enters between these and at the top—also there are inlet and exhaust taps for water. Everything considered, this, I think, is one of the best exhaust mufflers made. Aboard Elsa II a muffler of this type may be installed close to the engine cylinder. Then from each of its side outlets a length of $1\frac{1}{2}$ or 2 inch pipe should extend to within about 9 inches of the side planking. This pipe will not extend through the boat's side. Rather fit a pipe nipple 6 inches long through the planking, one each side and approximately in line with the pipe from the muffler. These nipples will be fastened through the planking with thin brass washers and lock nuts, one outside, one inside. The intervening distance between the nipples and the pipes from the muffler will be spanned with a heavy grade of steam hose, the latter well secured by hose clamps.

Thus it is apparent that all vibration from the motor will be arrested at the steam hose.



An exhaust which finds its exit on both sides of the hull has several advantages. The line is short and very easy to install. Despite the fact that the exhaust port on the engine is very near to the waterline there is little likelihood of water being drawn into the cylinder for the very simple reason that one end of the exhaust pipe is always free to the air and air is drawn in more easily than water. In rough water the engine will not pound through the exhaust first becoming submerged and then free to the air; a condition which happens very often even with an exhaust line which passes out through the stern.

In order to obtain every bit of length for accommodations I have eliminated the stern deck. While this may seem an innovation, it is a step in the right direction. I have noticed that a great many of the Navy's small boats are built in this way and I know from having built several craft in this way that it is entirely practical. A stout knee should be fitted in each corner of the stern for additional strength and then a high and substantial lazy back fitted.

Notice that the cockpit flooring extends right to the stern transom and that the nook under the stern seat is an ideal place for a gasoline tank.

I can already hear several kicks against the tiller. At least it is the least complicated of all kinds of steering gear, and I know that aboard a small boat a tiller is better than a lot of blocks and rope and rigging which costs good money and which is not nearly so reliable. Elsa is a little boat, you know, and one can almost reach in one stretch from the tiller to the companion slide.

The subject of construction need not be described here. I have tried to cover the generally used methods for the building of boats earlier in this series, and as the plans herewith

keep within the bounds of what has already been described, the building of Elsa II should not be a difficult operation.

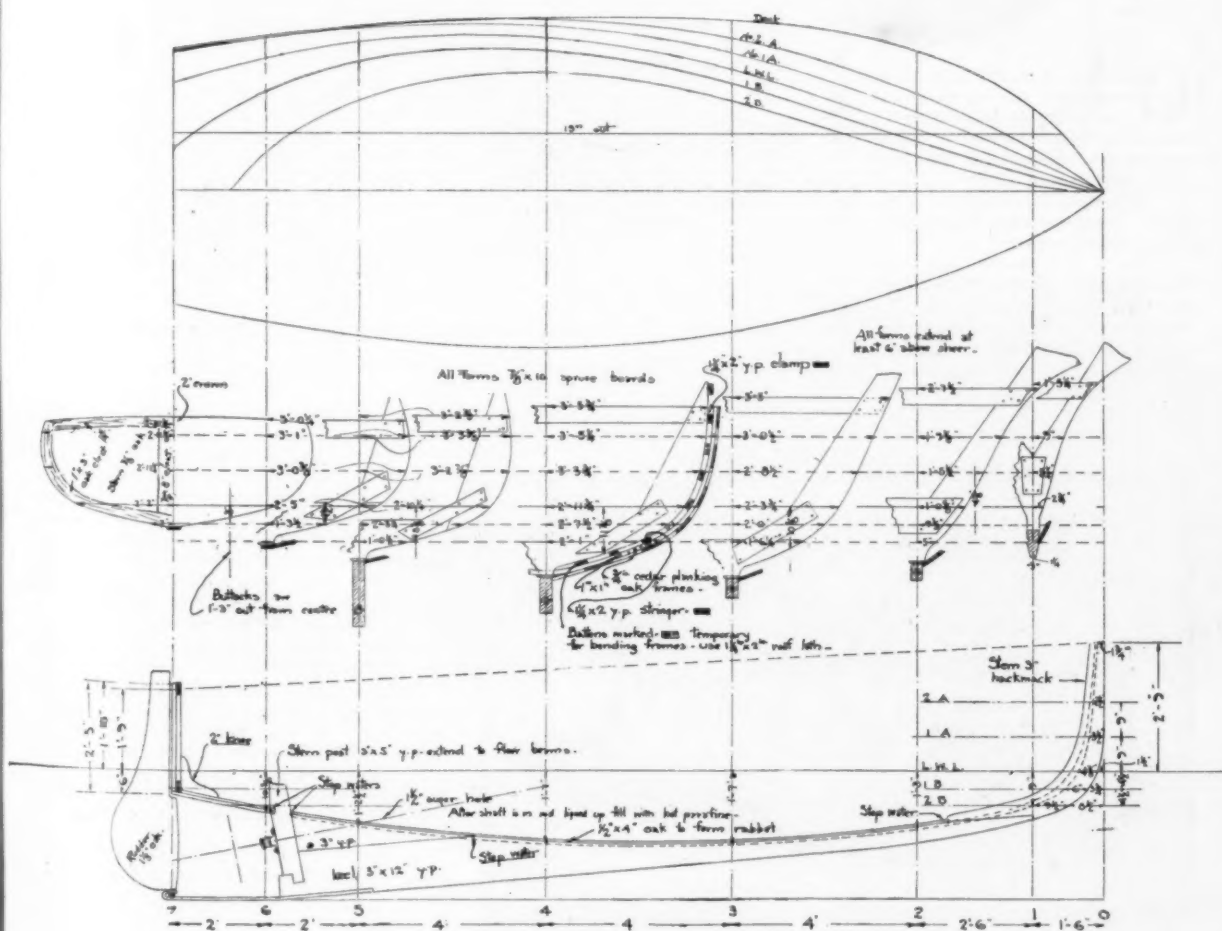
It seems to me that in the building of the cabin house I should fit three glass windows each side. These need not open, in fact for the sake of perfect water-tightness it is best to lay the glass for these in a nicely cut rabbet and hold them secure with wooden molding. As the glasses are being set in be sure to apply a bed of white lead for them.

The forward and after ends of the cabin house are the logical places for open port lights. Here they are easily fitted, being on a straight surface, and here also they catch all the breezes that blow. In all kinds of bad weather the after ones may be left open and I should suggest that they be fitted so as to have a drip board over each in order to shield them from rain.

I have designed somewhat over fifty boats of various types and sizes, excluding tenders and such little fellows. Practically all of these have been arranged so differently that I always hesitate before drawing cabin plans. Here the man who owns the boat knows better just what cabin arrangement he desires than anyone else. It seems to me then that the logical thing to do is to leave this part of the designing to the owner and this I'm doing here with Elsa II.

Always I shall be glad to help any of the readers of *MoToR BOATING* in their problems in connection with this boat and in closing these series of articles may I say I've found as much pleasure in writing them as I hope you all have in their reading.

Those who have been interested in this series by Mr. Atkin, and desire to preserve the articles for future reference will find them all in Vol. 2 of the *Ideal Series*, "How to Build Sixteen Ideal Motor Boats."—Editor.

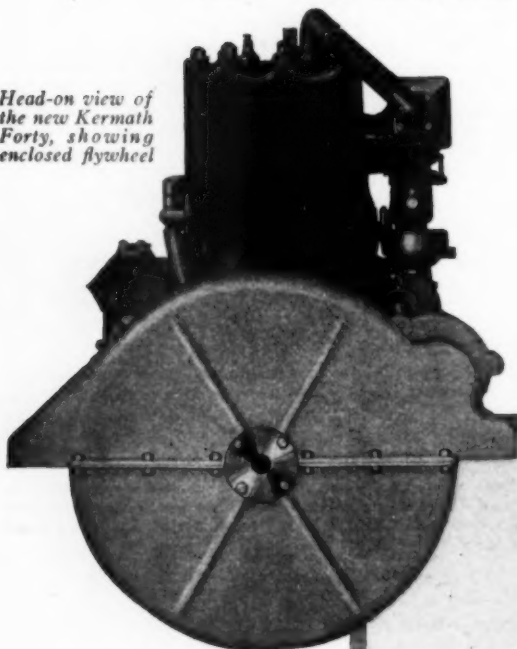


Lines of the successful 20-footer designed by Mr. Atkin

Introducing a New Marine Motor

All the Newest and Best Features of Marine Motor Engineering
Have Been Incorporated in the Newest Model Kermath

Head-on view of the new Kermath Forty, showing enclosed flywheel



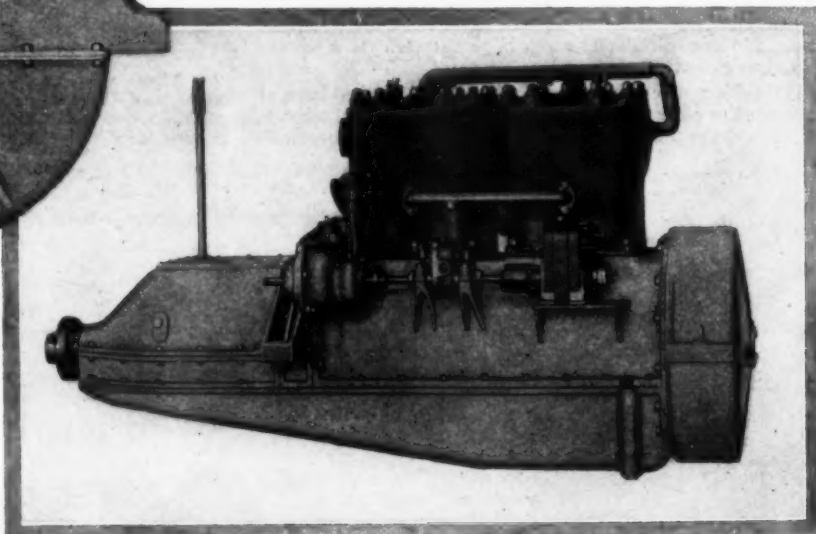
ONE of the most popular models of marine motors is the Kermath Vanadium 20, which has been adopted by the International Shipbuilding and Marine Engineering Corporation as the most suitable power plant for their "International Thirty-two" standardized cruisers.

After a full year of thorough trials under constant observation of their engineering experts a new model Kermath of 40 h.p. is just being put into production. This new machine is of twice the size and power of its smaller brother and will be many times more than twice as efficient. All of the newest and best features of marine engine practice

have been incorporated in this model. This motor has been particularly built to enable it to stand up under hard grueling service. Able to turn up to a speed of 1,200 r.p.m., it will deliver 47 h.p. when installed in a high-speed runabout or cruiser. For flexibility, it will throttle down to as low as 500 r.p.m., when its motion can scarcely be detected, so smoothly and quietly does it run.

For service such as would be required of a workboat this engine will turn a large size propeller at 600 r.p.m. with excellent results. The parts are all of ample proportion, bearings are liberal and forced feed lubrication through a hollow crankshaft contribute to a freedom from trouble.

This new Kermath motor is entirely enclosed, valve springs, tappets, flywheel, and all parts are completely out of sight, the only visible evidence of motion is the pump shaft.

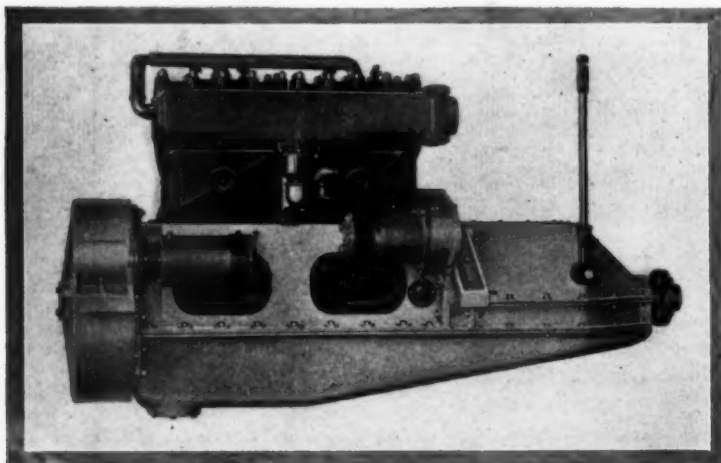


Magneto side of the Kermath Forty, note the high crankcase and enclosed clutch

Extreme rigidity in the crankcase is secured by an unusually deep section case, the alignment of the bearings and this part of the motor is perfectly maintained under all conditions. All valves are of extremely large diameter and the entire plant is designed to deliver full power with maximum efficiency. The reverse gear is entirely housed in and is an integral part of the machine. Its capacity is ample to transmit at least twice the power which the motor is able to produce. A factor of safety has been figured at this point such as is not generally found in other motors.

In building this motor the Kermath Manufacturing Company have spared no expense and only the best materials and highest grade accessories are used in its production. The crankshaft is a piece of special heat-treated chrome nickel steel. The oil pan and crankcase are rigid substantial castings of aluminum.

Ignition is by either a Bosch magneto or Atwater-Kent battery system, and other electrical equipment is a two-unit 12-volt Luce-Neville electric starter complete with Willard storage battery. All other accessories supplied are of the same high standard.



Carburetor side of motor showing two-unit electric starter and generator

A New Motor with an Old Name

Another Masterpiece in the Marine Engine World Is Produced by the Standard Motor Construction Co. to Take Care of Constant Full Load Service

AS a result of the experiences gained in building many powerful motors for the Navy during the war, the Standard Motor Construction Co., of Jersey City, N. J., has developed and perfected a new size and type engine for heavy marine service.

Built in 50 and 70 h.p. sizes in four and six cylinders with a bore and stroke of $6\frac{1}{2} \times 8$ inches, these engines are designed for maximum service.

all that is necessary to remove the camshaft is to take off the camshaft bearing caps. This is also true of the rocker shaft.

The exhaust manifold is made in one piece for each two-cylinder water jacketed section and the manifold is placed on a level with the cylinder head, and the exhaust piping to the muffler may be carried from either the forward or after end.

Ignition is of the high-tension jump spark system for the higher rotative speed in this engine. An impulse starter is connected with the magneto which allows the engine to be started on the magneto regardless of speed. The engine speed may be reduced to one revolution per minute and the maximum spark efficiency from the magneto still be had.

Compressed air for the whistle or for other purposes is obtained from an air compressor driven by an eccentric from off the engine shaft. The reverse gear is exactly the same as on the other Standard engines, but is enclosed. The thrust bearing is enclosed in oil, there being a number of thrust disks to distribute the load. The compression release lever can be thrown in the release regardless of position of crankshaft. The flywheel is put on the crankshaft with a taper to facilitate removing. The engine is equipped with



Port side of new Standard motor showing the manifolds on the intake side

Intended particularly for service in large fine-lined yachts and motor boats which will drive readily at higher propeller speeds, these motors will not supplant the heavier models. Such boats as heavy full-bodied house boats and work boats of all kinds are still most efficiently propelled by the slower turning heavy-duty machines.

The rotative speeds are higher than the regular line of heavy-duty Standards, these models operating at between 550 and 600 r.p.m. While the fundamental Standard principles of design and construction for continuous full-load operation have been adhered to and all typically Standard features incorporated in this new design, there are numerous excellent new features incident to the higher speeds.

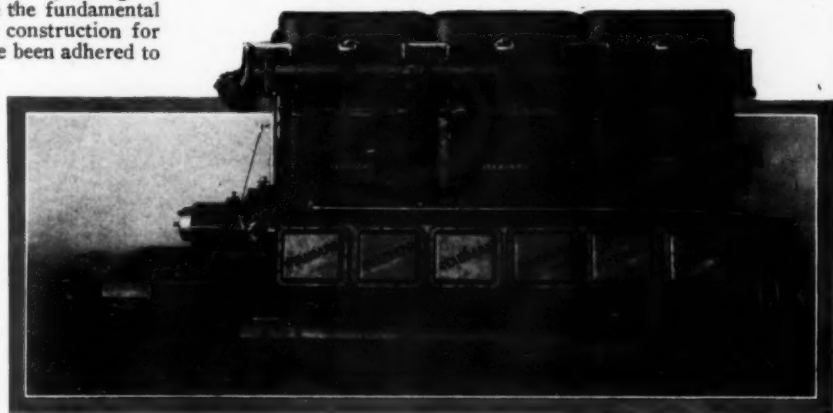
For example, where the valve in the head construction is maintained with as near a spherical combustion chamber as is practicable, both the inlet valve and the exhaust valve are mechanically operated and the valve operating mechanism is totally enclosed. The cylinders are water jacketed for their whole length and have no valve chambers in them.

The sub-base in this new engine is fundamentally the same, but has two webs instead of one for the support of each main bearing and without added complication circulating water keeps them cool at all times. The circulating pump is of the same Standard design as heretofore excepting that the valves are placed one over the other and the water discharge is carried through the base, eliminating some piping.

The intermediate base in the new engine is such as to enable the crankshaft to be raised and all of the main bearings to be replaced without removing the base. The camshaft is set in side bearings attached to the intermediate base so that

the regular Standard variable speed governor, and there is also a bronze reciprocating bilge pump running at only half the engine speed mounted on the forward end of the engine.

Lubrication is taken care of by a force-feed lubricator, with direct tubes leading to every part requiring oil. That is, the oil is actually delivered under whatever pressure that is required to the point where it is intended to be used.



Starboard side of new Standard motor showing large force feed lubricator

It is also possible to furnish a gasoline pump with these engines, when especially requested, for cases where neither a gravity feed nor compressor system can be used, or in other words, this engine has been designed to incorporate every desirable feature which the Standard Motor Construction Company has been able to observe from their many years of experience. The engine is furnished regularly with a small six-volt generator to take care of battery charging or for a limited lighting service. When desired a large generator and electric starting equipment can be furnished.

Which Is Your Ideal Auxiliary?

THE Ideal Auxiliary Series is finished. Thirteen amateur designers have told you what their Ideal is. Now is your chance to say which one of the thirteen is Your Ideal.

Plans of all the auxiliaries are reproduced on these two pages, all of them are drawn to the same scale so that you can readily size up the good points of each and compare them.

The thirteen plans and descriptions which we have published, one in each issue of MoToR BOATING since February, 1919, are not all which were submitted to us. Scores and scores of plans were received. It was a very hard task for us to determine just which ones should be published and which should not. We have been unable to print many plans well worthy of publication on account of lack of space. We endeavored to chose representative types of auxiliaries, some of each type and rig.

VOTE FOR THE BEST AUXILIARY

(Vote by Placing a Cross at the Left of the Boat's Name)

Vote	Boat	Length	Issue Published
.....	Victory	21 feet	February, 1919
.....	Carina III	30 feet	March, 1919
.....	Bonita	25 feet	April, 1919
.....	Drift	26 feet	May, 1919
.....	Pirate II	60 feet	June, 1919
.....	Volante	25 feet	July, 1919
.....	Gab	28 feet	August, 1919
.....	Josephine	35 feet	September, 1919
.....	Penguin II	29 feet	October, 1919
.....	Indrashama	35 feet	November, 1919
.....	Chatter	35 feet	December, 1919
.....	Little Pal	26 feet	January, 1920
.....	Euterpe	18 feet	February, 1920

Name of subscriber.....

Address of subscriber.....

This ballot must be in the hands of the Editor of MoToR BOATING, 119 West 40th Street, New York City, on or before April 16, 1920.

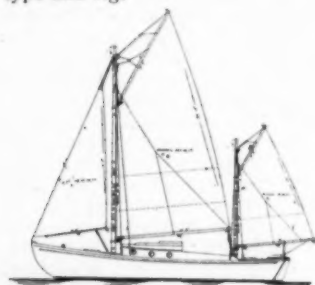
Votes received from persons or readers other than regular subscribers will not be considered. Subscribers on the basis as of March 1, 1920, as well as new subscribers whose subscriptions are received prior to April 16, 1920 may vote.

The prize of \$65 worth of equipment of the winner's own choice will be presented to the designer of the auxiliary receiving the greatest number of votes.

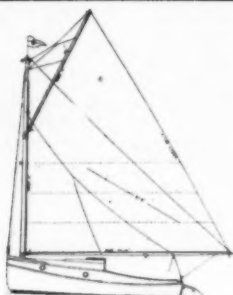
A very great deal of interest has been stirred up! We have received much favorable comment on the series as a whole and on the individual designs. Of course, some criticisms have reached us but this is only natural as no two enthusiasts will agree upon all the important features of any design. It is just this difference of opinion which we desired to crystallize. We believe that at least one of the thirteen designs will suit every motor boatman.

We hope all of our subscribers will vote for their choice. The designer who receives the greatest number of votes before April 16, 1920, will be awarded \$65 worth of boat equipment of his own choosing. If you do not care to cut your copy of MoToR BOATING, just indicate your choice in a letter or postal to us.

An announcement of the winner of the voting will be made in the May issue of MoToR BOATING.



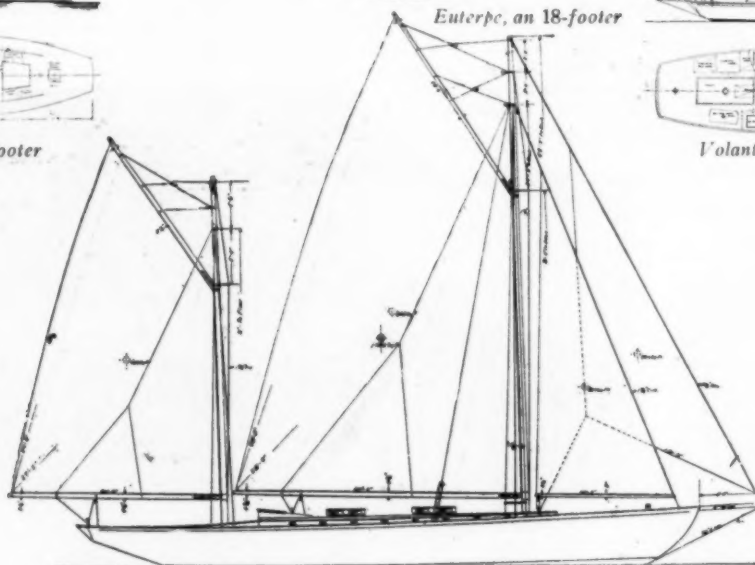
Bonita, a 25-footer



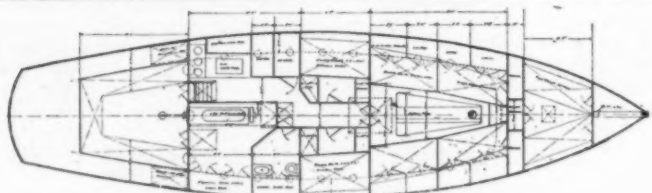
Euterpe, an 18-footer



Volante, a 25-footer



Pirate II, a 60-footer



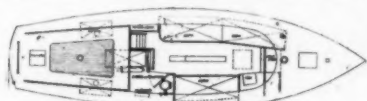
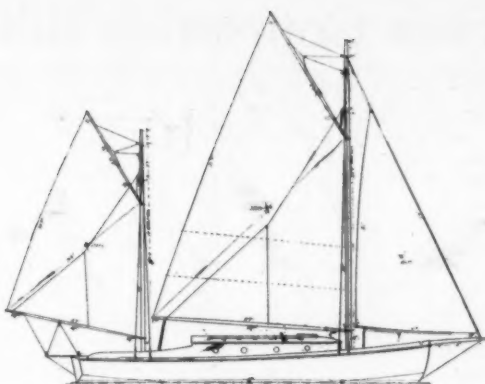
Plans of the Ideal Auxiliaries on pages 36 and 37 represent those published in MoToR BOATING from February, 1919, to February, 1920. All the plans are reproduced to the same

scale of 1/16-inch equals 1 foot.

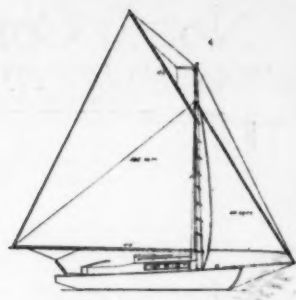
Larger, more complete plans in greater detail are printed in the issue in which the respective designs appear.



Gob, a 28-footer



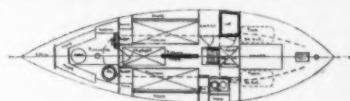
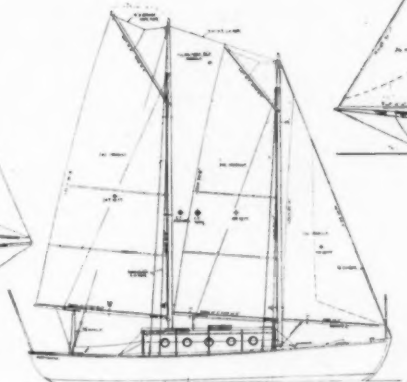
Josephine, a 35-footer



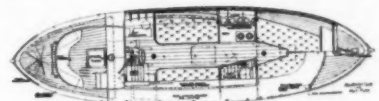
Drift, a 20-footer



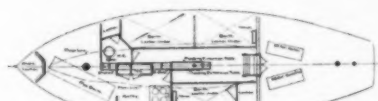
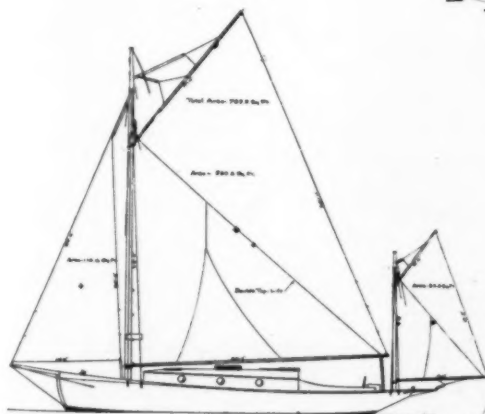
Penguin II, a 29-footer



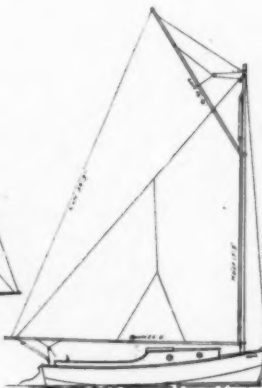
Carina III, a 30-footer



Indrashama, a 35-footer



Chester, a 35-footer



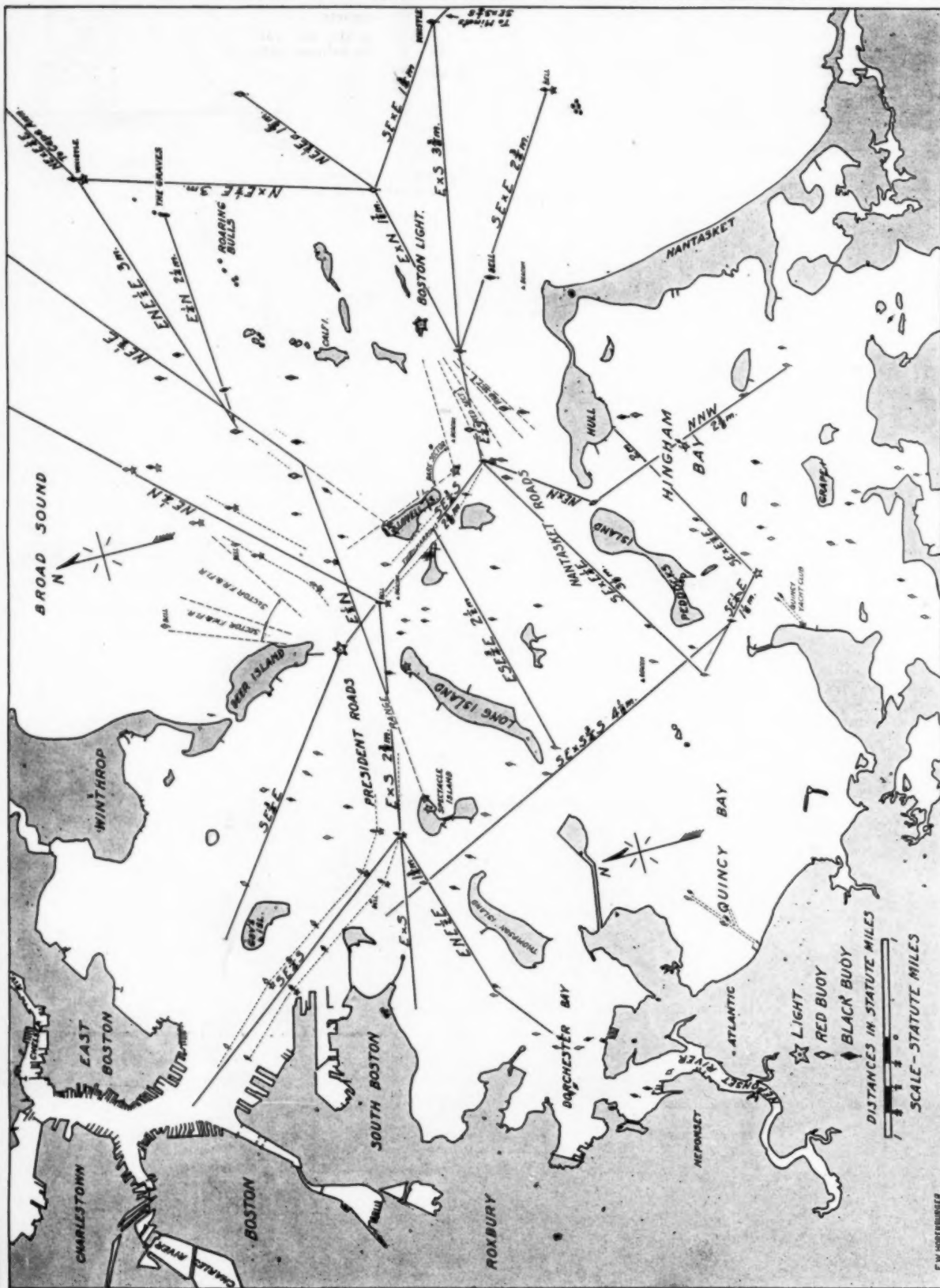
Victory, a 21-footer



Little Pal, a 28-footer

No. 5, Compass Courses on Boston Harbor

The fifth of the series of charts giving compass courses for various popular cruising grounds. This small chart shows only a few of the important lights and buoys. C. & G. S. Chart No. 246, should be consulted in connection with this one in order that all features not shown may be fully understood. Courses given here are magnetic and compass deviation should be corrected.



The New 300 H.P. Murray and Tregurtha

THE Model K-6 engine represents the latest type of design used in aeronautic practice. It has six vertical cylinders of $6\frac{1}{4} \times 7\frac{3}{4}$ inches bore and stroke, fitted with four valves per cylinder, seating directly on the cylinder head, thus eliminating the usual trouble with detachable cylinder heads, valve cages, etc., which are not permissible on an engine of such high mean effective pressure, as no gaskets have as yet been developed which will effectively stand the pressure.

The valves are operated by two separate camshafts, housed in aluminum tubes, the cams actuating on very light roller type push-rods directly on the valve stem, thus eliminating the high inertia load of the usual valve mechanism. A unique system of scavenging the oil from this cam case is employed, being a vacuum process which prevents any oil from running down the push rods. In operation, the housings are under one to two pounds vacuum, which is controlled by a scavenging pump of the gear type, located in the crank chamber and made integral with the main oil pump and crankcase scavenging pump. The cams are integral with the shaft, which is hollow, lubrication being provided under high pressure to each bearing, which are spaced so that no cam is located more than one-quarter inch from a bearing. The camshafts are driven by helical cut steel gears, heat-treated and ground, and mounted on the camshaft with four bolts and flanges, thus eliminating the trouble attending the usual type of keyed-on gears. The camshaft gear train is driven through a vertical shaft, which has the pinion gear on the upper end made integral with the shaft and mounted on ball bearings. It is driven from the crankshaft through the medium of bevel gears. The vertical shaft is hollow to provide means of transmitting the oil from the timing gear case to the sump. This shaft and gear are of chrome nickel steel, heat-treated and ground. The vertical shaft is housed in seamless steel tubing, in which the ball bearings for the vertical shaft are mounted. Throughout this engine all ball-bearing mounts have a bearing for the outer race in steel, thus eliminating all possibility of peening out of the metal back of the ball-bearing race.

Cylinders are of semi-steel, cast three en bloc. Particular care has been exercised in designing the water jacket space over the combustion chamber. Each cylinder is fitted with four valves, seating directly on the cylinder head, thus eliminating the attendant trouble from cages and gaskets. Oakley valves are used which have proved through an exhaustive test to be the best valves for marine service, due to the non-corrosive properties of the monel metal alloy.

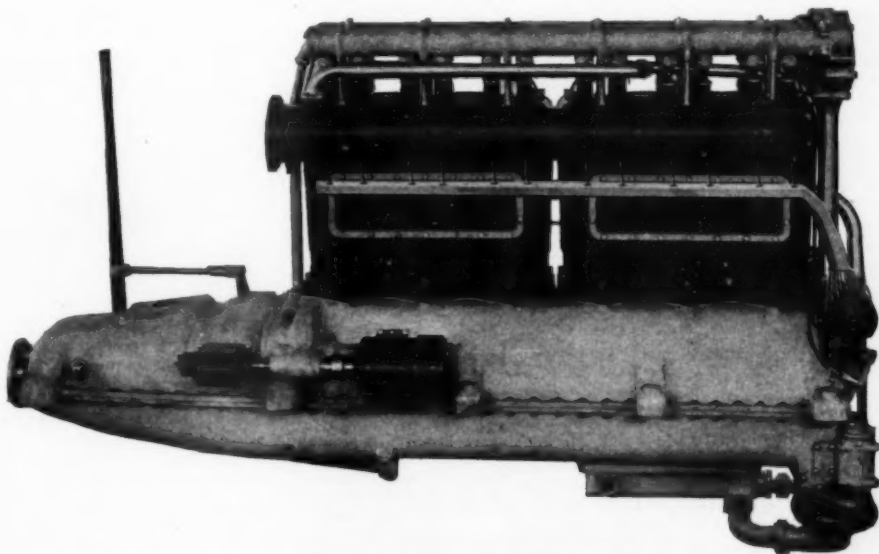
Four spark plugs are fitted to each cylinder in a horizontal position, directly beneath the valves, and are fired by two Kliesrath two-spark magnetos.

The exhaust valve guides are water jacketed to provide adequate cooling for the exhaust valve stem.

The cylinders are ground to size and are held to the crankcase by through bolts, going clean through the crankcase and holding up the chrome nickel steel main bearing cap. This feature is exclusive with Murray and Tregurtha design. The crankcase, through this type of construction, becomes a spacer between the main bearing cap and the cylinder, the opposing forces of the explosion driving the cylinder upward and crankcase downward is held by these through bolts made of chrome nickel steel heat-treated.

The crankcase is of aluminum, of very rigid section. The oil feed to the main bearings is delivered through a steel pipe cast integral in the crank chamber, and through drilled holes to the main bearings. All external piping is eliminated. Oil is provided to the main through a gear pump actuated from a gear off the forward end of the crankshaft. Three pumps are designed and built in one casting. One is a high-pressure delivery pump feeding all journals and bearings, to which is fitted a poppet valve pressure regulator. The second is a camcase scavenging pump, and the third a crankcase scavenging pump. All the oil which passes the poppet by-pass regulator is shunted through a circuit which passes through the oil cooler. By this means a differential flow of oil is continuously running through the oil cooler. Only the oil which is actually delivered to the bearings passes into the engine. By this means a constant circuit of the supply oil is passing through the oil cooler and thus keeping the oil temperature down to a permissible level. This feature is one which should appeal to every operator of a high speed motor. The oil pump is housed beneath a cover and is not fitted with the usual stuffing boxes and their attendant troubles, as the oil which seeps past the pump is merely discharged into the crankcase sump.

Crankshaft is of chrome nickel steel, seven-bearing type, hollow its entire length, and machined all over, heat-treated, with crank pins and journals ground. Oil is delivered to this crankshaft under a pressure of fifty pounds and is communicated through the shaft to the connecting rod bearings, and thence through steel tubes riveted in the I-section of the connecting rod to the piston pin, thus assuring positive oiling of all these members. Oil thrown from all these members supplies sufficient lubrication for the piston.



The new 300 h.p. Murray and Tregurtha motor, Model K-6, weighing less than seven pounds per horsepower

A Cruise or A Sail

A CRUISE or a sail! The most vivid imagination cannot even suggest words that carry such a sense of joy, of relaxation, of charm and of pleasant recollections as these. Nowhere can a sport be found so healthful, so invigorating, so manly and so diversifying. In no other way can one get so close to Nature as by a practical study of the seas and their tributary waters, the weather, the winds, tides and storms and in fact everything connected with the great out of doors, with which boating puts one in touch. All of these and even more are within easy reach of every boatman and amateur mariner.

Many a boatman or would-be boatman has such a well-defined notion of just what type, kind and size of boat he is to have when his ship comes in, that not only would no existing or already boat answer, but no design yet drawn could come anywhere near suiting him. This man knows what he wants but cannot express himself in words of arrangement plans, construction details, profiles, table of offsets, waterlines, displacement and such nomenclature. In this class probably falls the greatest proportion of lovers of the sea. Appreciating just this, we have prepared and printed as the opening chapter of Volume I, a very extensive treatise on Designing a Motor Boat, particularly written for the non-technical boatman in language which he can understand.

How to Design a Successful Motor Boat is divided into four parts. Part I takes up getting started correctly on the design, really the most difficult portion of the whole task. This includes the relation of various plans to one another, why certain shapes and forms are better than others, the relation of power and speed, displacement, trim, etc.

Part II of the article carries one through a systematic design, teaches him how to fair up, etc. Part III deals with simple calculations, such as displacement, trim, location of weights, etc. and Part IV takes up the finer points, such as the advantages of different forms, speed, weights, trim, stability, etc. Taken as a whole, we do not see how the article could be improved upon for the purpose it is intended.

The books of the Ideal Series cover all these points in a way never before done. Through the entire several hundred pages of the two Ideal books you will find some Designs and How to Build Articles that appeal to you—that you will like better than others.

Why is it that the old glass cabin boats are not popular and did not fill the bill—then the trunk cabin cruiser had its day—then the raised deck was and still is popular—then the double cabin boat, also the bridge deck. How about privacy in a small boat, is it worth sacrificing good points in the design to obtain it? Should the motor be in the cabin, under the deck or where? The designs of Ideal Cruisers, Runabouts and Auxiliaries will answer all of these questions.

How often have you heard it discussed as to where is the best location for the galley, should the berths be high or low, how wide, how much above the waterline should the cockpit floor be, should the bilge be ventilated, and if so, how. These are but a few of the problems which are solved for you in the books of the Ideal Series. In fact, there cannot a question arise as to what is standard practice in any form or particular about a boat's design or construction which will not be answered automatically for you by referring to these two new books.

Space prevents us from giving vent to our enthusiasm about the auxiliaries in these books. You know how a sailor man goes into rhapsodies whenever a sail boat is mentioned. Just so it is in the descriptions of the auxiliaries. There can be no doubt left in your mind as to why your auxiliary should be sloop, schooner, ketch, yawl or cat rigged.

The designs of the runabouts in Volume I and the construction methods describing how to build the different open boats in Volume II are excellent. You will make no mistake no matter which of the many type described, you choose. Designs of runabouts of lengths from 20 to 22 feet of every conceivable type are included.

Hike You is a comfortable little 20-foot speedabout designed to meet the popular fancy and one not restricted to any particular body of water. Naturally there are all sorts of runabouts and each type has its admirers. Some prefer the orthodox

round-bottom type while others swear by the more recently developed V-bottom Hand boat.

Goblin is a little 20-footer especially suited to inland waters and its proportions are such as to make it dry and safe even in rough water. It is moderate in cost, complete in equipment and easily handled.

Panther is a 20-foot hydroplane which makes an ideal two-passenger runabout. She is of the concave V-bottom wave collector type which possesses many advantages over other types.

Magnet is a 21-footer and a splendid little boat and practical and general requirements, including yacht tender service for larger craft. Magnet's extreme beam is 5 feet 2 inches and she has seating accommodations for five or more passengers.

Another 21-footer is America, which might be called a cruising runabout. She is low in initial cost, reasonable in up-keep and running expenses, has good speed, is capable of seating six or seven persons comfortably and taking them safe and dry through any waters a boat of 21 feet in length might venture.

Curlew, a 22-foot runabout, is particularly adapted for open-water service and for trips up rivers tributary to the sea. She is a real boat, capable of trips in any weather and strong and staunch enough to last for many years; small enough not to be a burden when it comes to hauling out and painting and fast enough to be able to make a good trip in a reasonable time.

Sandpiper, a 24-foot V-bottom runabout, has for its feature ability to navigate shoal water and yet has sufficient strength to go to sea when necessary.

L'Allegro is a 25-footer designed for coastwise work. She has a long forward deck which tends to protect the passengers and crew and the cockpit is large and comfortable. A large reserve buoyancy forward minimizes the flare. The greatest beam is amidship with the lines being finer forward and aft.

Tuna is a 27-foot shallow-draft runabout of the greatest service when waters are lashed into short, steep waves with foaming crests. There are plenty of cruisers able to meet these requirements but runabouts are rare. Considerable thought is given to the design of Tuna, to the shape of the hull and the amount of power to drive the hull so as to obtain the maximum pleasure and efficiency.

Zora is the largest of the runabouts and is 28 feet in length. She is a wonderful all-around boat, having plenty of room, stability and a good cruising radius. Speed was rather a secondary consideration but a speed of from nine to ten miles an hour is quite sufficient.

Trident is a trunk cabin cruiser with a large open cockpit and has an overall length of 24½ feet. For a run out into the open sea she is just the type of cruiser for week-ends and has a good turn of speed. In a boat of this type it is safe to venture outside for fishing and other trips and she will be perfectly capable of weathering any sea which is likely to come up before the run to sheltered waters can be accomplished.

Cygnus, a 25-foot cruiser with the open type of trunk cabin, is comfortable, seaworthy, good to look at and at the same time economical to build and run. She has accommodations for two rather tall persons, good storage space for clothes and supplies and something more than a little dark, poorly ventilated coop with about four-foot headroom in which to spend rainy nights at anchor in a harbor.

Halcyon is a 28-footer that is different from the ordinary variety of cruiser. To begin with, she is a very seaworthy boat, has ample headroom in the cabin, a large amount of dead rise in the forward sections which tends to keep the boat on her course. She has a fair amount of flare extending well aft.

Flashlight, a 30-foot V-bottom cruiser, was designed from experience. She is of inexpensive initial cost and her maintenance should be low. She is a boat perfectly suited for week-end or holiday trips or for vacation use.

Dawn is a double-cabin bridge-deck cruiser of a type which has such peculiar charm to many boatmen. She measures 32 feet in overall length and has a beam of 8 feet 6 inches and a draft of 3 feet.

Sunray, the prize winner in the Ideal Cruiser competition, is a 36-foot double-cabin boat of the most up-to-date type. She is probably just the kind of boat that you have been dreaming about so long which, of course, must embody all those pet notions of yours which seem so ideal. It must possess not merely temporary quarters but real comfort for several people to live in with room also to accommodate in like fashion, when occasion demands, several more.

Spook is another 36-footer with unusual accommodations. She will sleep four and, since triangular forward staterooms are not practicable in a small boat, an after cabin with berths for two solves the problem. Spook has the model of a whale boat, which embodies seaworthiness to the highest degree. However, her model is modified to some extent to give her a square stern which permits the use of a higher powered motor, as it gives greater bearing aft.

(Continued on page 98)

New Types of "Down Easters"

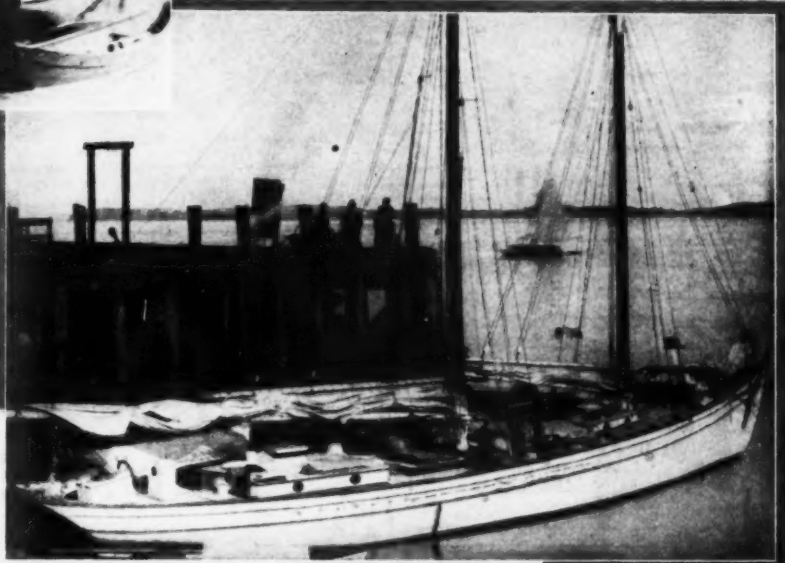


Representing the "Coming and Going" of sardines, as the craft on the right carries 60 hogsheads of newly caught herring from weirs to Eastport and Lubec, Me., sardine factories, while the one on the left carries 2,700 cases of newly packed American sardines from the factories for shipment

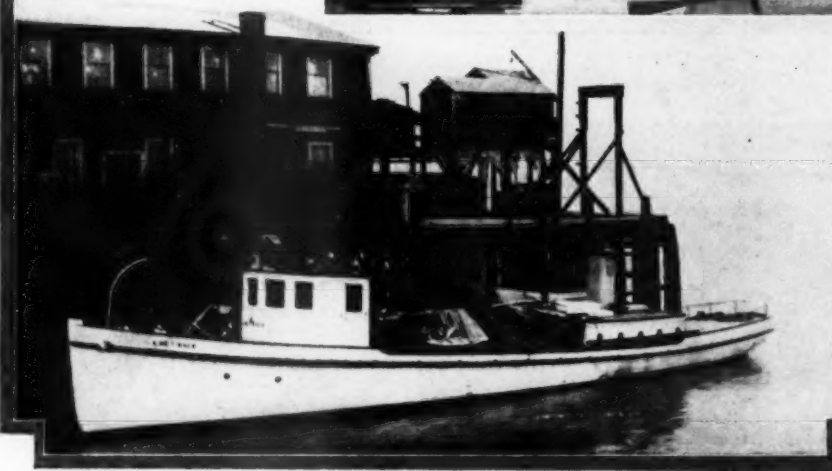


Newest addition to the large sardine fishing fleet of Passamaquoddy Bay, Eva H., owned at Eastport, Me.

A type of Eastport harbor sardine fishing craft. She costs about \$7,000, is 77 feet long, 16 feet wide, equipped with a 50 h.p. gasoline engine, and a few of this type have crude oil engines. She has twin propellers and carries 75 hogsheads of herring. Many types of motors are used in this fishing fleet, although the majority are Knox and Mianus makes



The handsomely modeled King Fisher is one of the largest of her kind in Eastern Maine waters. She is owned by the William Underwood Canning Company, operating a sardine factory at Jonesport. Built at Quincy, Mass., in 1908, she was originally equipped with two 75 h.p. gasoline engines, but they have been replaced with two Fairbanks-Morse engines of the same h.p. She has a speed of 10 to 12 knots, has two propellers, electric lights and a powerful searchlight



Yard and Shop

Notes of Interest to Both Owner and Manufacturer



A reproduction of the Hal E. Roach Trophy, which is to be raced for at Los Angeles during the next few months, and is to be given outright to the owner of the boat which makes the fastest mile in Southern California during the season of 1920

Wilbur Young with Columbian Bronze

Wilbur H. Young, president of the Gasoline Engine Equipment Company and vice-president of the College Point Boat Corporation, is now associated with the Columbian Bronze Corporation as vice-president. Mr. Young is one of the old-timers in the boating industry, having been intimately connected with it for the last twelve years. In 1910 he organized and became president of the Gasoline Engine Equipment Company, which concern was one of the pioneers in the development of motor boating in New York district.

Mr. Young was instrumental in developing the direct-connected gasoline electric generating units and during the war designed and perfected a number of special devices along this line for the United States War and Navy Departments and for several of the foreign allied governments.

The Columbian Bronze Corporation is to be congratulated on having Mr. Young associated with them, as his knowledge of boats is such that he can be of material benefit in recommending to boat owners the most efficient wheel for them to use.

We understand that Mr. Young will devote his time primarily to the propeller department of the Columbian Bronze Corporation, es-

Schedule of Principal Racing Dates, Season of 1920

(NOTE—Complete detailed information as to the following races may be had by addressing the Chairman of the Race Committee of the Club in charge of the race.)

- May 31—Adelphia Yacht Club, Carnival, Delaware River Yacht Racing Association.
- June 5—Camden Yacht Club, Regatta, Delaware River Yachtmen's League.
- June 12—Westville Power-Boat Association, Regatta, Delaware River Yacht Racing Association.
- June 12—Opening Race of the Columbia Yacht Club, New York City, all classes.
- June 19—Wilmington Motor Boat Club, Cartledge Trophy, Delaware River Yacht Racing Association.
- June 26—Riverside Yacht Club, Regatta, Delaware River Yachtmen's League.
- June 26—Bermuda Race, Columbia Yacht Club, New York City.
- July 2—New York to Albany and Return Race, New York Motor Boat Club, 270 statute miles.
- July 10—Block Island Race, New York Athletic Club, Travers Island, 115 statute miles.
- July 17—New York to Cornfield Light and Return—Colonial Yacht Club, New York City, 210 statute miles.
- July 17—Columbia Yacht Club, Regatta, Delaware River Yachtmen's League.
- July 24—Keystone Yacht Club, Regatta, Delaware River Yacht Racing Association.
- July 31—Riverside Yacht Club Cruise, Chesapeake, Pa.
- Aug. 8, 10 and following days—At Cowes, England, Races for the British International Trophy.
- Aug. 18, 19—Cruise to Long Island Sound, Delaware River Yacht Racing Association.
- Aug. 14—American Power-Boat Association Cruiser Championship, 75 to 100 miles over New York Athletic Club course, Long Island Sound.
- Aug. 21—New York to Poughkeepsie and Return, Colonial Yacht Club, New York City, 130 statute miles.
- Aug. 21—Wisconsining-Trenton, Regatta, Delaware River Yacht Racing Association.
- Aug. 28—New York Athletic Club Navigation Race, Travers Island, New York.
- Aug. 28—Wisconsining Yacht Club, Regatta, Delaware River Yachtmen's League.
- Sept. 2—Detroit, Mich., Gold Cup Races for American Power-Boat Association Championship of America.
- Sept. 3, 4, 5, 6—Fisher Trophy Races for the Displacement Boat Championship of America Silver Trophy Races for the 730 cubic inch piston displacement championship of America.
- Sept. 4—Anchor Yacht Club, Freitas Trophy, Delaware River Yacht Racing Association.
- Sept. 6—Trials for the One-Mile Championship of America.
- Sept. 11—Farragut Sportsmen's Assn., Regatta, Delaware River Yachtmen's League.
- Sept. 12—Open Races, Hudson River Yacht Club, New York City, all classes.
- Sept. 19—Camden Motor-Boat, Record Trophy, Delaware River Yacht Racing Association.
- Sept. 19—Ocean Race of the Tamaqua Yacht Club, Brooklyn, New York.
- Sept. 25—Forrest Hill Boat Club, Cruise-Picnic, Delaware River Yacht Racing Association.
- Oct. 9—Fall Regatta of the Columbia Yacht Club, New York City, all classes.



One of the old-timers in the Motor Boating game is Wilbur H. Young, who recently became associated with the Columbian Bronze Corporation as vice-president. Mr. Young is to devote his time primarily to small boats and their propeller equipment

pecially as it touches on the requirements of the motor boat owner, and he will be more than glad to personally reply to any letters written to him for advice as to the proper size and pitch of wheel to use.

A Bill to Prevent Theft of Boats

A bill to prevent the theft of motor vehicles, which will include motor boats. Again we are able to present to our readers a summary of a bill of great benefit to the automotive world at large and the motor boatmen in particular. This bill was introduced in Congress on February 12th by Senator Hareld and has for its main object the establishment of a Federal Motor Registration Bureau, with registrars in each State, for the purpose of certifying to all transfers of motor vehicles or conveyances used for traffic by air, land, or water, and to prevent the sale or transfer of such vehicles until a certificate of ownership has been procured from such Federal motor registrar.

The term motor vehicle within the meaning of this bill shall include every type of motor vehicle, and motor boats are specifically included.

It is apparent that the features involved in this proposed legislation are of vast importance to all motor (Continued on page 60)



A roomy, comfortable, and fast little boat is Bob Kat, shown in the accompanying illustration, and owned by James L. Clark, of New York Yacht Club. Her Red Wing Thorobred Motor, 28-36 h.p., drives her at a speed of 18 m.p.h.

VALENTINE'S VALSPAR

The Varnish That Won't Turn White

Dustin Farnum and His Boat— Famous Film Star is a Valspar Fan



ON the left inside the circle is Dustin Farnum, well known motion picture star. On the water is *Miss Los Angeles* the Hacker-designed boat which the actor drove to victory in the classic Nordlinger cup race last fall.

Like so many other boat owners, Mr. Farnum has found that the right varnish plays a mighty important part in keeping a fast boat tuned up to racing pitch. Under the date of December 12th, 1919, he writes:

"The *Miss Los Angeles* is finished with Valentine paint and Valentine Valspar Varnish from the keel up. You probably know that this is a very telling climate on boats, outside especially.

The *Miss Los Angeles* is finished bright above the water line with Valspar, has been in the water about three months, and looks as well today as when she was put overboard."

"As for the Valspar bronze paint used on the bottom of the *Miss Los Angeles*, it is the most wonderful thing I've ever used. She has been in the water for three months and has not been touched or cleaned; and when I had her out on the ways last Sunday, I found the bottom as clean as a whistle."

The booklet, "How to use Valspar on Boats," is full of useful varnish and paint tips. We will send it to you on request.

VALENTINE & COMPANY

Largest Manufacturers of High-grade Varnishes in the world—Estab. 1832

New York Chicago Boston Toronto
London Paris Amsterdam
W. P. FULLER & CO. Pacific Coast

Photos. courtesy Hall Scott Motor Car Co.

VALENTINE & COMPANY, 456 Fourth Ave., N. Y.

Special Offer:

For your dealer's name and 15c in stamps, we will send you a 25c sample can of Valspar—enough to finish eight square feet of surface. Fill out Coupon.

Dealer's Name.....

Your Name.....

Your Address.....

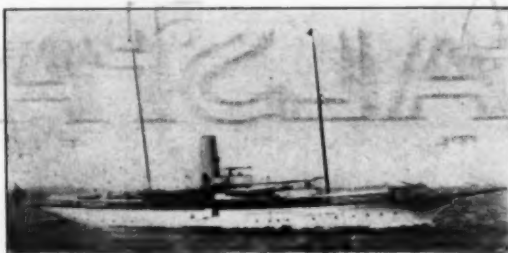
McTear Boating 3-20

Naval Architects
and
Yacht Brokers

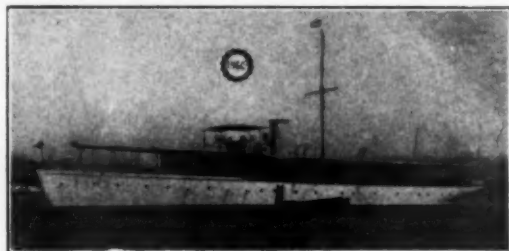
COX & STEVENS

15 William St., New York
Telephone—1375 Broad
Cable—BROKERAGE

We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request.



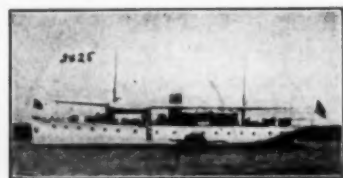
No. 71—For Sale—200 ft. seagoing steel steam yacht. Lloyd's highest rating. Cox & Stevens, 15 William Street, New York.



No. 1466—Particularly desirable 140 ft. twin screw steel cruising power yacht; speed up to 18 miles; two 300 H.P. Standard motors; dining saloon and social hall on deck; 3 double and 1 single staterooms, 3 bath and toilet rooms, etc. Recently overhauled thoroughly at large expense; in splendid condition. Further particulars, from Cox & Stevens, 15 William Street, New York.



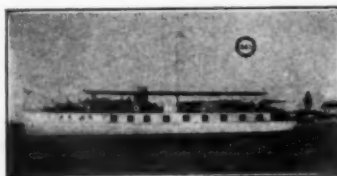
No. 2026—For Sale or Charter—Twin-screw cruising power yacht; 107 x 18 x 5.3 ft. Speed 11-12 knots; 75/90 H.P. Standard motors. Four staterooms, deck, dining saloon, bath and two toilets, etc. Recently completely overhauled at large expense. Cox & Stevens, 15 William Street, New York.



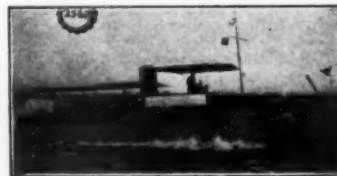
No. 2425—For Sale or Charter—Twin-screw cruising power yacht; 90 x 16.6 ft. Speed up to 12½ miles; two 6 cyl. 60/90 H.P. motors. Excellent accommodation. Cox & Stevens, 15 William Street, New York.



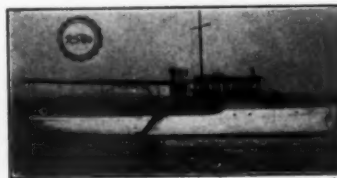
No. 1991—For Sale—Cruising power yacht; 81 x 12 x 4 ft. Speed up to 15 miles; 6 cyl. 100-120 H.P. "20th Century" motor. Dining room, three staterooms, toilet room, etc. Cox & Stevens, 15 William Street, New York.



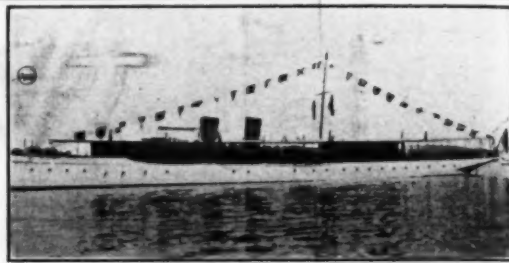
No. 1662—For Charter—Attractive 90 ft. twin-screw gasoline houseboat; speed 10-12 miles. Large saloon, four staterooms, two bathrooms; all conveniences. Handsomely furnished. Cox & Stevens, 15 William Street, New York.



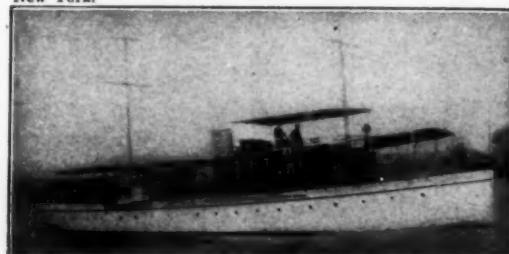
No. 2560—For Sale—Fast, V-bottom, twin screw power cruiser; 60 x 13 x 4 ft. Built 1917. Speed up to 18 miles; two 6 cyl. Sterling motors. Double stateroom forward; roomy saloon aft with separate galley; two toilet rooms (one with Sitz bath). Low price for quick sale. Cox & Stevens, 15 William Street, New York.



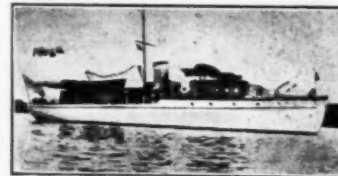
No. 2500—For Sale—Twin-screw 69 ft. power yacht. Speed up to 13 miles; two 40 H.P. motors. Enclosed bridge, large dining saloon, two double staterooms, galley, etc. Splendid condition throughout. Cox & Stevens, 15 William Street, New York.



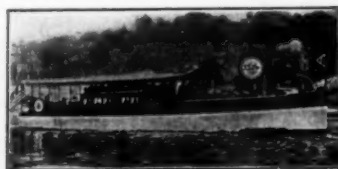
No. 3047—For Sale—Particularly attractive 165 ft. fast oil-burning, twin screw, steel steam yacht. Speed up to 19 miles. Beautifully finished and furnished. Large accommodations include dining saloon and music room on deck, six staterooms and three bathrooms below aft. Cox & Stevens, 15 William Street, New York.



No. 1796—For Sale or Charter—Very roomy, twin-screw cruising power yacht, 99 x 17 x 4 ft. Speed 13 to 15 miles; Standard motors. Large dining saloon, six staterooms, three bathrooms, all conveniences. Cox & Stevens, 15 William Street, New York.



No. 1806—For Charter—Twin-screw power yacht; 67 x 14.6 x 3 ft. draft. Speed up to 13½ miles; two 40 H.P. Sterling motors. Large saloon with two extension berths, two staterooms, bath and toilet, galley, etc. Roomy bridge deck and large cockpit. Price attractive. Cox & Stevens, 15 William Street, New York.



No. 3326—For Sale—Fast bridge deck cruiser; 55 x 8.9 x 3 ft. Speed up to 23 miles; 8 cyl., 200 H.P. Speedway motor. Two berths in cabin, toilet room, large cockpit, etc. Price attractive. Cox & Stevens, 15 William Street, New York.



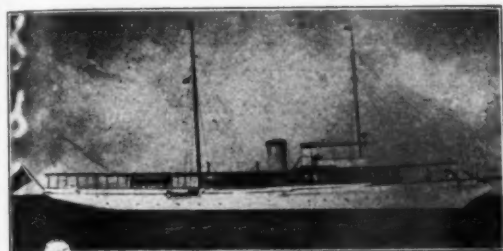
No. 3560—For Sale—Fast bridge deck cruiser; 45 x 10.6 x 3.6 ft. New 1917. Speed 18 miles; 125 H.P. 6 cyl. Sterling motor. Double stateroom, saloon, galley, toilet room, etc. Price reasonable. Cox & Stevens, 15 William Street, New York.

Naval Architects
and
Yacht Brokers

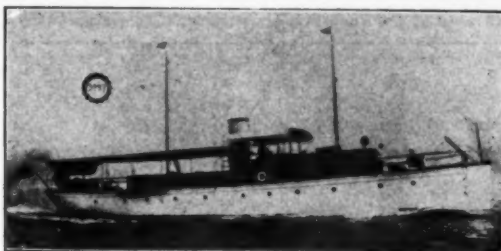
COX & STEVENS

15 William St., New York
Telephone—1375 Broad
Cable—BROKERAGE

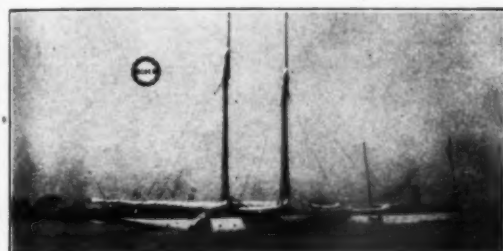
We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request.



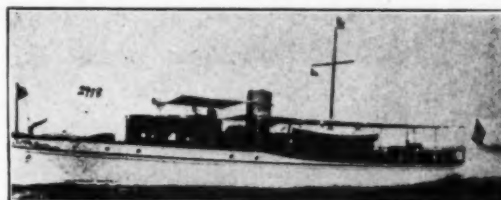
No. 1225—For Sale—Twin-screw cruising power yacht; 137 x 15.9 x 7.8 ft. Speed up to 18 miles; two 6 cyl. 300 H.P. Speedway motors. Excellent accommodations. Cox & Stevens, 15 William Street, New York.



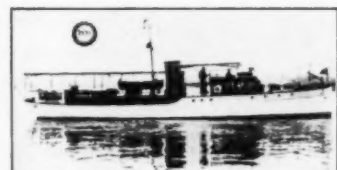
No. 3489—For Sale—Particularly desirable 90 ft. twin-screw power yacht. Speed up to 17 miles; two 115 H.P. Winton motors. Three staterooms, saloon, bathroom and 2 toilets, etc. Excellent condition. Cox & Stevens, 15 William Street, New York.



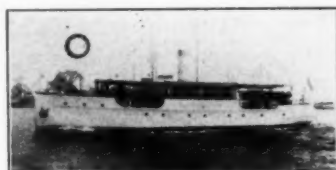
No. 3044—For Sale—Auxiliary schooner, 107 x 78 x 22 x 12 ft. Built 1914. Standard motor. Four staterooms, saloon, galley, etc. Further particulars, price, etc., from Cox & Stevens, 15 William St., New York City.



No. 2978—For Sale—Very attractive twin-screw power yacht, 80 x 14 x 4 ft. Speed 13-14 miles; two 50-60 H.P. motors, new 1919. Two saloons, two double staterooms, bathroom and two toilets, galley, etc. In excellent condition. Cox & Stevens, 15 William Street, New York.



No. 3533—For Sale—Fast 72 ft. twin-screw cruising power yacht. Speed up to 17 miles; two 6 cyl. 125-150 H.P. Winton motors. Dining saloon, two double staterooms, bath and two toilets, galley, etc. Price, etc., from Cox and Stevens, 15 William Street, New York.



No. 3538—For Sale—Very roomy power yacht; 72 x 16.5 x 3.11 ft. Built 1917. Speed 10-11 miles; 75 H.P. motor. Main saloon in deckhouse, dining saloon below, three double staterooms, bath and two toilets, galley, etc. Large deck space. Price reasonable. Cox & Stevens, 15 William St., New York City.



No. 1937—For Sale—Attractive 65 foot cruising power yacht. Speed up to 12 miles; 60-80 H.P. motor. Two saloons with two berths in each, double stateroom, bath and toilet room, galley, etc. Price reasonable. Cox & Stevens, 15 William Street, New York City.



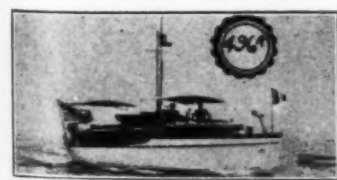
No. 2625—For Sale—High speed twin-screw 66 ft. day cruiser. New 1917. Speed up to 24 miles; two 8 cyl. 150 H.P. motors. Saloon with upper and lower berths, double stateroom, galley, etc. Exceptionally large cockpit. Price attractive. Cox & Stevens, 15 William St., New York City.



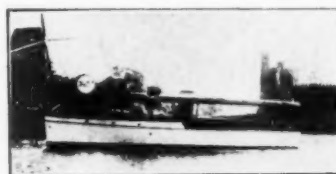
No. 3689—For Sale—Fast Hand V-bottom day cruiser, 45 x 10 x 3 ft. draft. Built 1918. Speed up to 20 miles; Sterling motor. In excellent condition. Cox & Stevens, 15 William St., New York City.



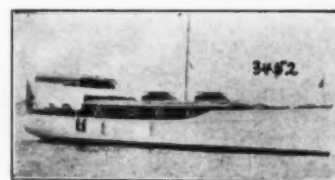
No. 2815—For Sale—54 ft. Elco-de-Luxe day cruiser. Standard motor. Excellent condition. Price reasonable. Cox & Stevens, 15 William St., New York.



No. 496—For Sale—Bridge deck cruiser, 52 x 11 x 3.7 ft. Speed 10 to 11 miles; Standard motor. Double stateroom, saloon, toilet room, gallery, etc. Reasonable price for quick sale. Cox & Stevens, 15 William Street, New York City.



No. 3678—For Sale—Bridge deck cruiser, 58 x 13 x 4 ft. New 1916. Speed up to 12 miles; 50 H.P. Standard motor. Dining saloon containing two pullman berths, two double staterooms, two toilet rooms, galley, etc. Cox & Stevens, 15 William Street, New York.



No. 3452—For Sale—Attractive 40 foot raised deck cruiser. Speed up to 12 miles; 40 H.P. motor. Sleep four comfortably in owner's party. Further particulars, price, etc., from Cox & Stevens, 15 William St., New York City.

NAVAL ARCHITECTS
ENGINEERS
BROKERS
MARINE INSURANCE

HENRY J. GIELOW

52 BROADWAY, NEW YORK

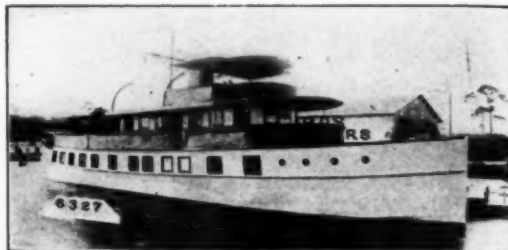
ALSO: CHICAGO STEAMBOAT EXCHANGE, 350 NORTH CLARK STREET, CHICAGO

Telephone: 4673 Broad
Cable Address:
Crogie, New York
A.B.C. Code

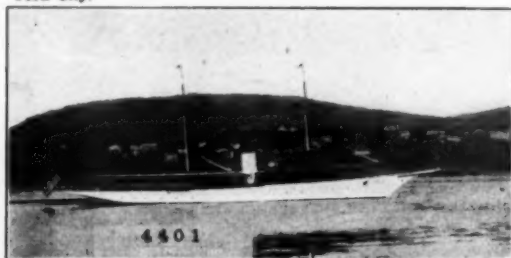
We have a most complete and up-to-date list of power yachts of all sizes, sail, auxiliary and houseboats on file in our office, kept constantly up-to-date by a thorough and comprehensive canvass of the entire yachting field from time to time. We are in a position to submit full information on any type of boat upon request. FOR SOUTHERN CRUISING this winter we offer a number of very desirable POWER HOUSE BOATS and POWER YACHTS which are specially adapted for FLORIDA waters.



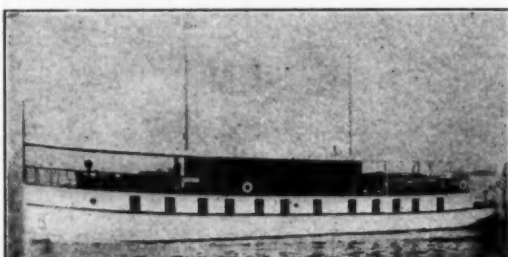
No. 3422—For Sale—Desirable 94 foot twin-screw steel power yacht. Deck dining room. Two double staterooms, bath and two toilets. Hot water heated. Standard engines. Speed 12 to 14 miles. Price reasonable. Henry J. Gielow, 52 Broadway, New York City.



No. 6327—Sale or Charter—98 foot cruising houseboat. Built 1919. Owner's stateroom with adjoining bathroom and lounging room in deck house. Below five staterooms, three bathrooms and dining room. Henry J. Gielow, 52 Broadway, New York City.



No. 4401—For Sale—137 ft. very attractive twin screw motor yacht. Speed 15 to 16 miles. Built by Lawley. Deck dining room and smoking room. Three double staterooms. Hot water heated. Price attractive. Henry J. Gielow, 52 Broadway, New York City.



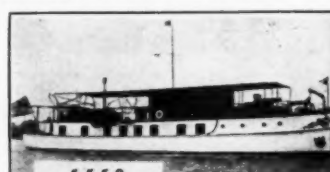
No. 5006—For Charter—Desirable twin screw 100 foot cruising houseboat. Speed 12 miles. Deck, dining room and lounging room. Seven staterooms, three bathrooms. Now in commission. Henry J. Gielow, 52 Broadway, New York City.



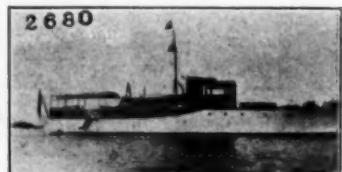
No. 5403—For Charter—Desirable 51 foot houseboat. Standard motor. Large deck space. Two double and two single staterooms. Electric lights. Accommodations for seven persons. Henry J. Gielow, 52 Broadway, New York City.



No. 2958—For Sale—Twin screw 120 foot steam yacht. Speed up to 24 miles. Deck dining room. Built by Seabury. Suitable for ferry or racing yacht tender. Henry J. Gielow, 52 Broadway, New York City.



No. 5559—For Sale or Charter—Attractive 75 foot cruising houseboat. Standard engines. Deck lounging room. Three double and one single stateroom. Bathroom. Now in Florida. Henry J. Gielow, 52 Broadway, New York City.



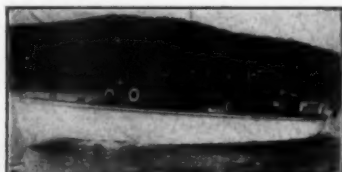
No. 2680—For Sale—Attractive 75 foot power yacht. Practically in commission. Two staterooms with double beds. Bathroom. Standard engine. Speed 12 miles. Able sea boat. Inspectable New York. Henry J. Gielow, 52 Broadway, New York City.



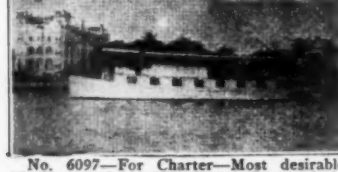
No. 6418—For Sale—72 foot twin screw bridge deck cruiser. Built 1917. Winton motors, 150 H.P. each. Deck dining room. Two double staterooms, and bathroom. Electric and hot water heated. Henry J. Gielow, 52 Broadway, New York City.



No. 6311—For Sale—115 foot twin screw steel power yacht. Standard motors, 100 H.P. each. Dining room in forward deck house. Social hall in after house. Four staterooms and bathrooms. Henry J. Gielow, 52 Broadway, New York City.



No. 3307—For Sale—Desirable 59 foot cruising power yacht. Standard engine. Double stateroom. Good sea boat, inspectable New York. Price attractive. Henry J. Gielow, 52 Broadway, New York City.



No. 6097—For Charter—Most desirable 62 foot cruising houseboat. Large deck, lounging room, dining room, one double and two single staterooms, bathroom. Now in southern waters, available for coming season. Henry J. Gielow, 52 Broadway, New York City.



No. 6417—For Sale—45 foot hand express day cruiser. Built 1918. Speed 22 miles. Toilet room. Cabin and galley. Large cockpit. Henry J. Gielow, 52 Broadway, New York City.

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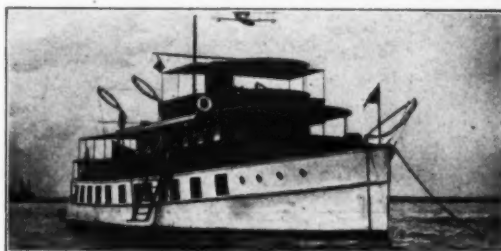
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No. 8102—Sale—Charter; most desirable raised deck cruiser available; practically new, 81 ft. x 13 ft. x 5 ft. draft. Speed 15 miles, electric light, hot water, heat and refrigerating plant.



No. 1926—Sale—Charter 98—New houseboat; 6 staterooms, 3 bathrooms, dining saloon, sitting room; electric lighted and hot water heat.



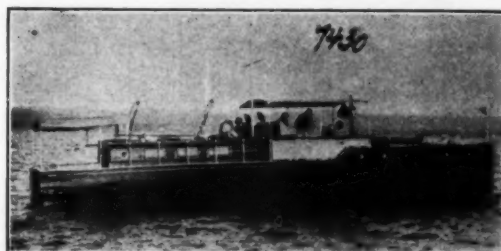
No. 7992—For Sale—Modern steel motor yacht, 115 ft. 7 in. x 17 ft. x 5 ft. 3 in. draft. 2—100 H.P. Standard motors. Speed 15 miles. Commodious owners' quarters.



No. 1927—Sale—Charter—Very desirable; twin screw houseboat; 5 staterooms, 3 bathrooms, dining saloon, lighted by electricity and hot water heat.



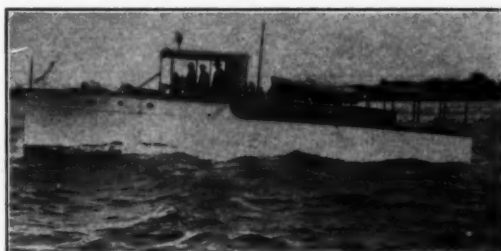
No. 1934—Sale Bargain, houseboat 61 ft. overall by 24 ft. beam, 4 staterooms, dining room, living room, conservatory, bath, etc., hot water heat, electric light and refrigerating plant. Most luxuriously fitted and furnished.



No. 7430—Sale—Fast cruiser; 56 ft. x 11 ft. x 3 ft.; has 8 cylinder, 200 H.P. Sterling motor; speed 18½ miles; excellent accommodations; very complete equipment.



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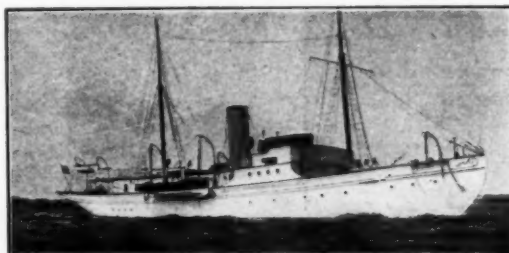
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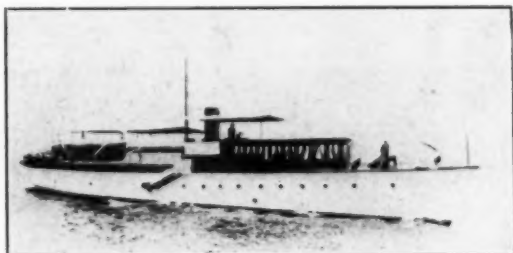
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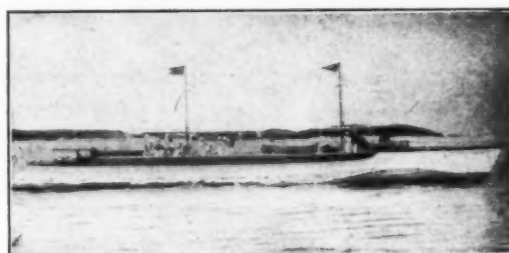
No. 1338—Power Yacht, flush deck, 135 x 15.8 x 7.6. Lawley built, two 250 H.P. Speedway motors, splendid accommodation.



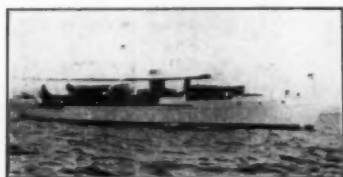
No. 328E—English built Steam Yacht. Classed 100 A-1 Lloyds. Inspectable New York waters. 151 x 24.9 x 12.9. Magnificent sea boat. Adapted extensive cruising. Exceptionally well arranged accommodations.



No. 1840—Attractive motor yacht, 107 x 95 x 18.3, best construction, two six cylinder Standards.



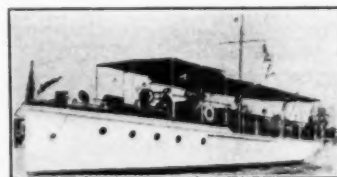
No. 841—Twin-Screw Power Yacht, 110 x 13, two 80 H.P. motors; offered by an Estate. Photograph made from painting.



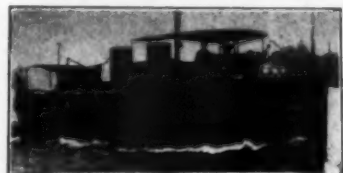
No. 1377—Attractive Twin Screw Cruiser, 70 x 13.6, two Twentieth Century motors, two double staterooms, saloon, etc.



No. 1821—Twin Screw Power Yacht, 90 x 15.4, two six cylinder motors, good accommodation, etc.



No. 1880—Desirable cruiser, 60 x 12, six cylinder motor, speed 12-14 miles. Mahogany pilot house recently added.



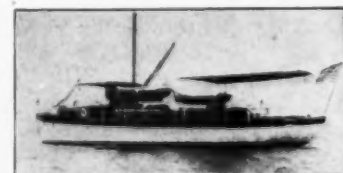
No. 2023—Bridge deck cruiser, 68 x 11.3, eight cylinder Sterling, installed 1916, speed 15 miles.



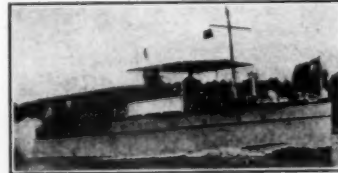
No. 2108—Fast Motor Boat, 40 x 5.6, 8 cylinder 175 H.P. Sterling engine, speed 22/25 miles. Mahogany finish.



No. 2479—Palmer built cruiser, 36 x 9, sleeps four, 20 H.P. Palmer motor.



No. 1919—Bridge deck cruiser, 60 x 12.6, Ralaco motor, 50 H.P., deck control.



No. 2312—Express Cruiser, 60 x 13, two six cylinder Sterlings, speed 18-20 miles, first-class condition, attractive figure.



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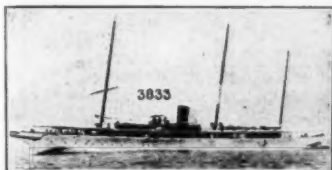
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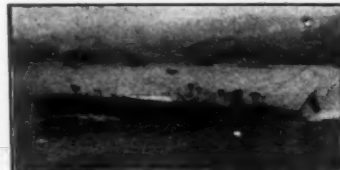
No. 1 Broadway New York City

Our list comprises all the available yachts for sale and charter. Below are a few of our offerings. Our knowledge of the yachts we offer, and our 25 years' experience in the business insure satisfaction to any one buying or chartering a yacht through this office

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No. 2115—35 foot Elco Express Runabout. 60 H.P. Elco American & British motor. Speed 24 miles. Price \$2,000.00.



No. 1529—65 foot Power Yacht. Double stateroom, main saloon, dining saloon, bath, etc. Speed 12-14 miles.



No. 1443—110 ft. twin-screw power yacht. Five staterooms, dining saloon, baths, etc. Speed 11-12 knots.



No. 4320—Strictly high class fast oil-burning, twin-screw steel steam yacht, 165 ft. x 18 ft. x 7 ft. Six staterooms, three baths, dining saloon, music and smoking rooms. Speed up to 20 knots.



No. 1373—Twin-screw 90 foot power yacht. Four staterooms, dining saloon, social hall, main saloon, two baths. Speed 13 miles.



No. 1926—Twin-screw Power Yacht, 60 ft. x 13 ft. x 3 ft. Double stateroom. Three berths in main saloon. Two toilets, bath, etc. Two 125 H.P. Sterling motors. Speed 17 miles.



No. 1334—Twin-screw 60 foot cruiser. Double stateroom forward saloon, after saloon. Sleeps 6 or 8 people. Speed 12 miles.



No. 1564—68 foot power yacht. Two staterooms, main saloon, shower bath, steam heat, electric light, etc. Speed 15 miles.



No. 2112—33 foot cruiser. Four extension berths in cabin. 25-40 H.P. Sterling Motor. Speed 9-10 miles. Electric lights, searchlight, etc. Price attractive. Have just sold owner much larger boat.



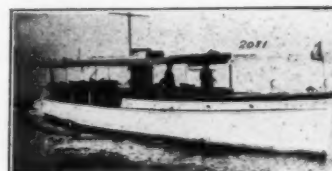
No. 4316—Sale or charter 100 foot power houseboat. Six staterooms. Dining saloon, two baths, etc. Speed 9-11 miles.



No. 4322—Sale or charter. Twin-screw 85 foot power houseboat. Five staterooms, dining saloon, three baths, etc. Speed 10 miles.



No. 4231—Sale or charter, 85 foot power houseboat. Five staterooms, dining saloon, bath, etc. Speed 10 miles.



No. 2081—58 foot power yacht. Two double staterooms main saloon, two toilets, etc. Speed 12-14 miles.



No. 1111—Sale or charter, 90 foot twin-screw power yacht. Four staterooms, dining saloon, two baths, etc. Speed 12 miles.

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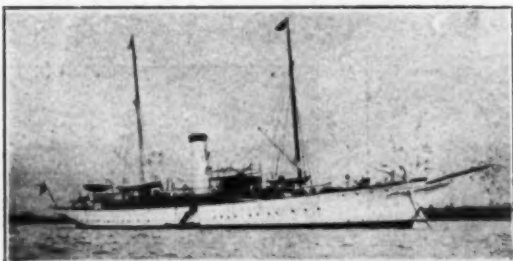
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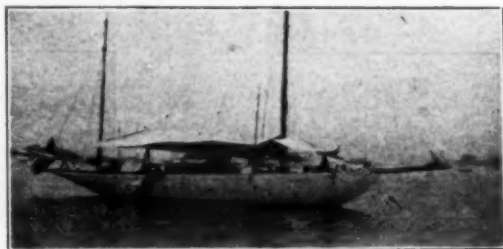
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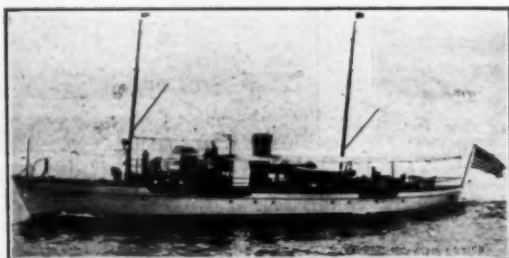
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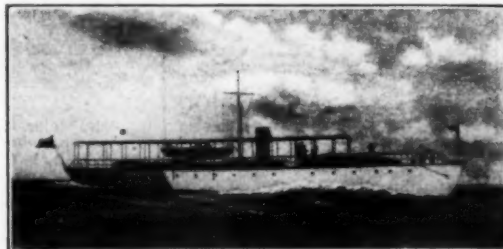
No. 5266—Sea Going Steam Yacht—Length 230 ft. 765 tons. Designed by Watson. One of the finest yachts afloat. FRANK BOWNE JONES, Agent, 29 Broadway, New York.



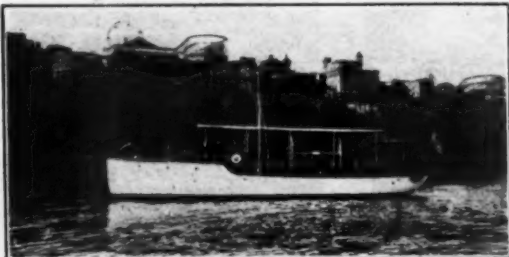
No. 3002—Flush Deck Auxiliary Yawl, length O.A. 68 ft. W.L. 45 ft. Beam 17 ft. Draft 17½ ft. 3 staterooms, saloon, etc. 25 H.P. motor. FRANK BOWNE JONES, Agent, 29 Broadway, New York.



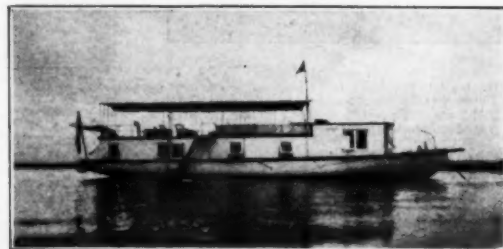
No. 3191—For Sale or Charter—95 ft. gasoline yacht. Exceptionally fine cruiser, twin screw. Delivery in Florida waters. Splendid proposition. FRANK BOWNE JONES, Agent, 29 Broadway, New York.



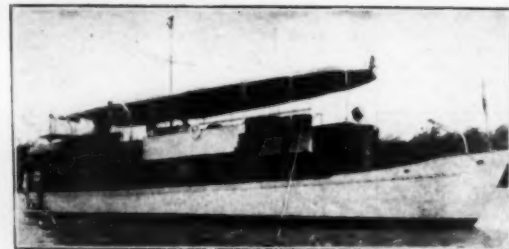
No. 4243—Express Cruiser, length 92 ft. Of best design and build. Twin-screw. 250 H.P. Speed up to 18 miles. Price below value. FRANK BOWNE JONES, Agent, 29 Broadway, New York.



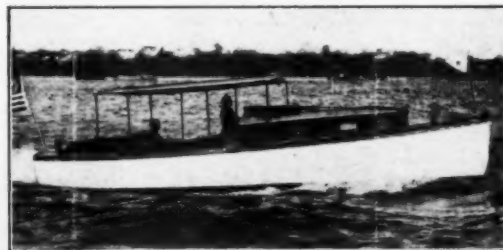
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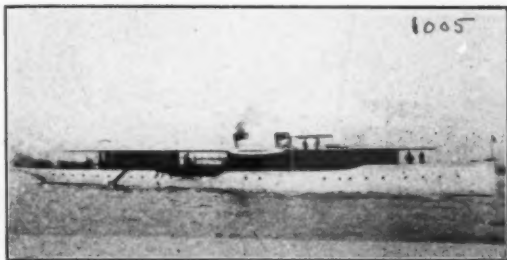
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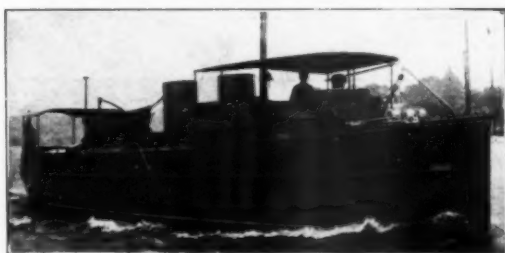
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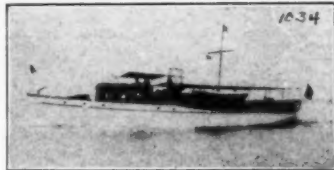
No. 557—For Sale—An exceptionally attractive and seaworthy 68 ft. yacht. 3 staterooms, shower and hot water heating plant. Speed 14 miles. Motor equipped with self-starter.



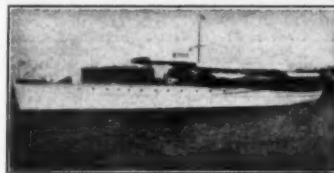
No. 292—For Sale—Finest 50 footer afloat. 1 double stateroom and saloon. Sleeps 6 persons besides crew. New motor with self-starter. Excellent condition. Speed 14 miles.



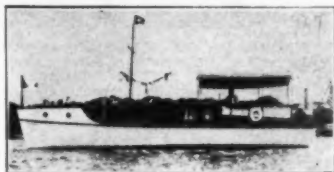
No. 636—For Sale—45 ft. express cruiser. Sleeps 4 persons besides crew. Speed 18 miles.



No. 1034—For Sale—80 ft. twin screw cruiser. 3 staterooms, bath, etc. Speed 14 miles.



No. 759—For Sale—110 ft. twin screw oil burner. 3 double staterooms, saloon, bath, etc. Speed 16 miles.



No. 967—For Sale—36 ft. cruiser. 1 double stateroom and saloon. Built 1917. Speed 10 miles.



No. 945—For Sale—60 ft. twin screw express cruiser. Sleeps 7 persons. Speed 22 miles.



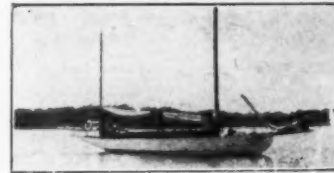
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No. 1055—For Sale—64 ft. auxiliary schooner. Sleeping accommodations for 7 besides the crew.



No. 464—For Sale—36 ft. Exco runabout. Very good condition. Speed 23 miles.



No. 804—For Sale—37 ft. auxiliary yawl. Accommodations for 6 persons. Yacht in excellent condition.

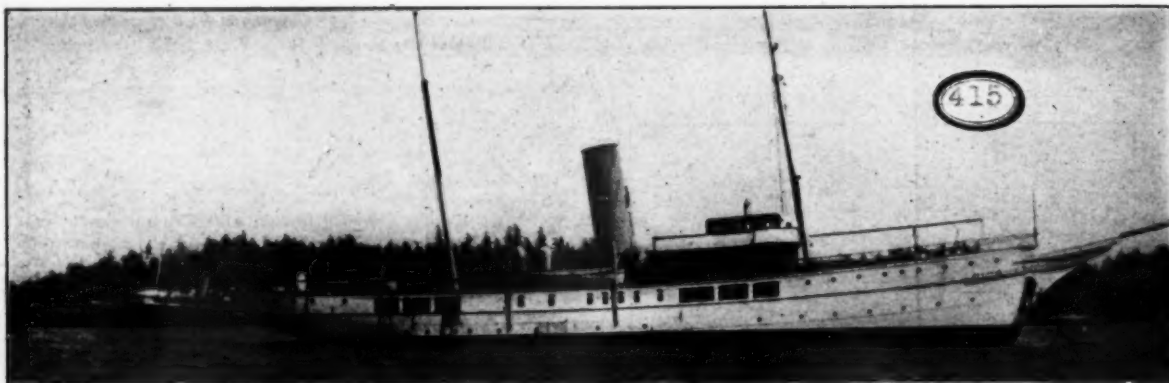
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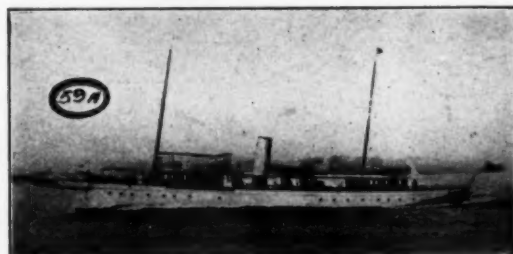
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No. 83—For Sale—85 ft. twin screw cruising yacht. 16 ft. 7 in. beam, 3 ft. 6 in. draft. Excellent for southern cruising. Three double, one single staterooms, bath, also dining saloon on deck. Cruising speed 14 miles. Is in excellent condition and fully equipped with every modern convenience.



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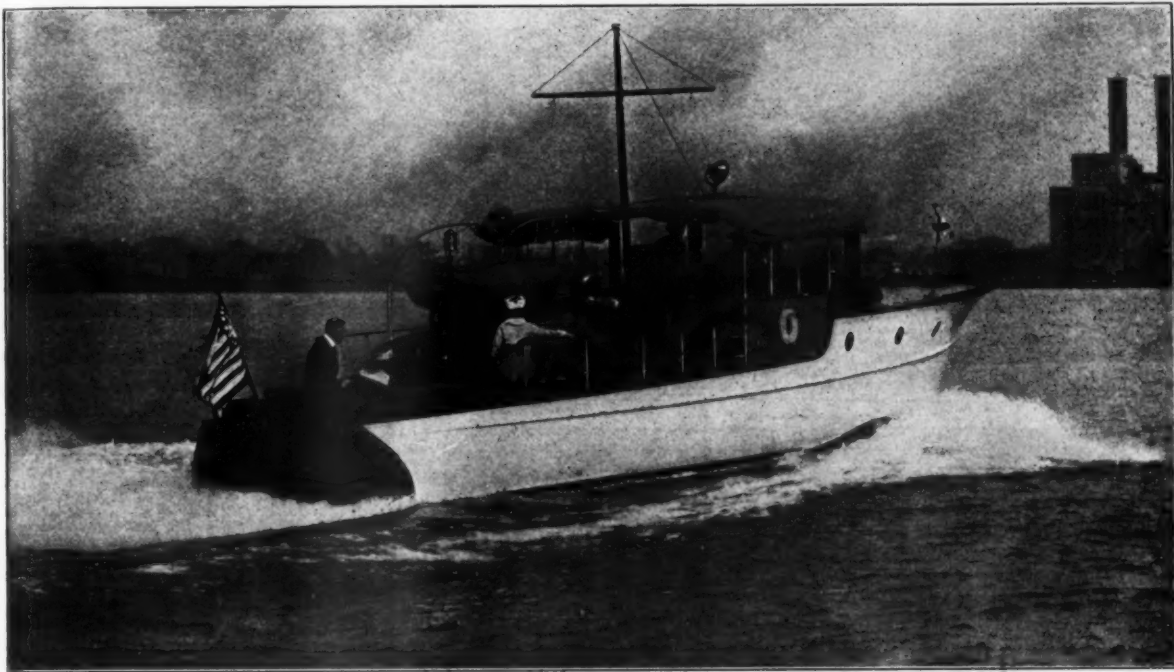
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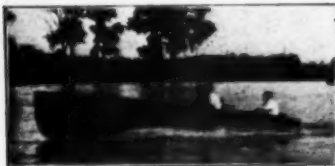
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No. 608—One of the prettiest and best designed fast cruisers on the market. 44 ft. x 43 ft. x 9 ft. 6 in. x 3 ft. 6 in. Designed by Swasey, Raymond & Page. Built by the Baker Yacht Basin Co. in 1915. Has 15 ft. cockpit, and large saloon. Headroom 6 ft. 2 in. Is finished in San Domingo mahogany. Sleeps four. Has small auxiliary sail plant. Engine is 125 H.P. Van Blerck, speed 20 miles. Inventory most complete, includes, dinghy, tools, spare propeller, new generator, etc. Apply Linton Rigg Yacht Agency, 136 South 4th St., Philadelphia, Pa.



No. 256—For Sale—One of the finest bridge deck cruisers available. 68 x 67 x 11 ft. 3 in. x 4 ft. 2 in. 21 net tons. Planking yellow pine, copper fastened. Only six years old and has been well taken care of. Has two double and one single stateroom, and large main saloon. Sleeps seven. 150 H.P. Sterling motor. Speed 13 knots. Has been recently overhauled and is in first class condition. Apply Linton Rigg Yacht Agency, 138 So. 4th St., Philadelphia, Pa.



FOR SALE—White cedar runabout with complete equipment, including electric lights, leather cushions, anchor, etc. Twenty-two feet long, edge nailed, automobile control. Three cylinder, two cycle, twelve horsepower, high speed "Ferro" engine, in good condition. Three years old. Price \$500.00. D. J. McLane, Schenectady Boat Club, Schenectady, N. Y.



Excellent family cruiser and fishing boat, 39 ft. 11 in. x 10 ft. 7 in. x 3 ft. Planking cypress. Boat and engine built 1917. Has double stateroom forward. Main cabin aft. Galley and engine room amidships. Berth in pilot house. Engine, Peerless 4 cylinder, 5¾ x 7. Inventory complete. Apply Linton Rigg Yacht Agency, 138 South 4th St., Phila., Pa.

USED MATTHEWS ELECTRIC LIGHTING PLANTS. Automatic Marine and Land types—one and two kilowatts—32 volt—attractive prices—Widger & Miller Co., Matthews Dealers, 141 Milk St., Boston, Mass.

FOR SALE—Small wireless set, receiving and sending outfit, cost \$70.00; will take \$40.00. Percy M. Child, 1110 14th St. N. W., Washington, D. C.

FOR SALE—One 62 Ft. Motor Yacht. Standard Motor. Speed 10 Miles. \$7,000.00. Percy M. Child, 1110 14th St. N. W., Washington, D. C.

FOR SALE—1 40 Ft. Raised Cabin Cruiser. Sterling Engine, Speed 9 Miles. \$3,300. Percy M. Child, 1110 14th St. N. W., Washington, D. C.

FOR SALE—Cruising houseboat 41 x 11 x 3—engine room aft—then galley, main cabin, toilet and washroom, forward stateroom; 20 H.P. engine; electric light, price \$1000. Boat seen at Schenck's boat yard, foot Bay 46th St., Gravesend Bay, Brooklyn, N. Y. Owner, Henderson, 403 Clermont Ave., Brooklyn, N. Y.

Get your engine in this great cleanup sale of Marine, Truck and Auto engines, also other accessories—2 cyl. 6 H.P. and 3 cyl. 18 H.P. 2 cycle Hegeman; 6 cyl. 4 cycle Loew-Victor-Harbeck; 6 cyl. 4 cycle Lamb; 4 cyl. 4 cycle Cadillac, \$45.00; 4 cyl. 4 cycle Overland, \$45.00; 4 cyl. 4 cycle Olds, \$45.00; 4 cyl. 4 cycle small Continental, \$40.00; 4 cyl. 4 cycle large Continental \$150.00; 4 cyl. 4 cycle Marathon, \$45.00; 4 cyl. 4 cycle Alco, \$150.00; 12-14 H.P. 2 cyl. 4 cycle Monarch unit plant; 4 cyl. 4 cycle Republic; 4 cyl. 4 cycle Thomas; 1 cyl. 3 H.P., 2 cyl. 5 H.P., 2 cyl. 8-10 H.P., 3 cyl. 9 H.P., 1 cyl. 4-5 H.P., 2 cyl. 18 H.P., all 2 cycle Monarch; 2 cyl., 12 and 2 cyl. 15 H.P. Detroit; 4 cyl. 12 H.P. 4 cycle Morton; 4 cyl. 12 H.P. 4 cycle Kermath; 3 cyl. 20 H.P. 2 cycle Ferman; 2 cyl. 24 H.P. 2 cycle Kalenberg; 1 cyl. 6 H.P. and 2 cyl. 9 H.P. 2 cycle Gray; 1 cyl. 4 H.P. 2 cycle Sindy, \$55.00; 2 cyl. 6 H.P. and 3 cyl. 7½ H.P. 2 cycle Lockwood-Ash; 1 cyl. 5 H.P. 2 cycle Watkins unit plant; 3 cyl. 21 H.P. 2 cycle Gray unit plant; 4 cyl. 20 H.P. 2 cycle Simplicity; 3 H.P. Aristocrat; 1½ and 3 H.P. Ferro; 1½ and 5 H.P. Detroit; 3 and 3½ H.P. Fairbanks-Morse; 3 H.P. Spaulding; 10 H.P. 2 cyl. Ferro; 2 cycle 10-12 and 20-25 H.P. 4 cyl. 4 cycle Michael; 5 H.P. 2 cyl. Gile; 2 cycle 4 H.P. 2 cyl. Dunn, 4 cycle, \$45.00; 4 cyl. 4 cycle Buick; 2 H.P. Evenrude; 35-45 H.P. 6 cyl. Burgess, 4 cycle, \$380.00; Model "C" Baldridge reverse gear, \$45.00; 1 No. 3 Carlyle Johnson gear; 1 80 lb. Kedge anchor, \$5.00; write for complete list. Jesiek Boat Co., Grand Rapids, Mich.

Auto Motors Supplies—Buick, Michigan, Stoddard, Dayton, Hupp 32, Cadillac, Overland, E.M.F., Continental and Buda motors. All types \$50 each and up. Bosch Magneto, \$15 each and up. Special High Tension 2 and 4 cylinder magnetos, \$9.50 each. Prest-O-Lite Tanks, \$5.00. Coils, Carburetors, Air Compressors, Generator, Starters, etc. Write for Bargain Bulletin. Second Hand Auto Accessories. Address Motor Sales Dept. B, West End, Pittsburgh, Penna.



FOR SALE—Cruiser, 31 ft. x 9 ft. 2 in. x 3 ft. Heavy Oak and Cypress Construction. Ribs 2 in. x 2 in. and Heavy Keel Oak. Planking Cypress 1½ in. x 4 in. Compromise Stern Enclosed, Self-bailing Cockpit, Galley Stove, Built-in Ice Box, Sink, Closets, Toilet and Washbowl. Sleeps 3 to 6. High grade heavy duty engine; all upper works Mahogany, all Hardware bronze. Head room throughout, all in A1 condition. Write for Photo; full description. Price \$2500.00. Chas. J. Becker, 453 Webster Ave., St. Louis, Mo.

Wanted—Wherever there are boats, representatives to handle our speed indicators, taffrail logs, and marine meters selling from \$8 to \$65. Can you consider a good proposition? Write for details. Irvin W. Masters, Muncie, Ind., U. S. A.

Sale: 6 cyl. Pierce-Arrow 66 H.P. \$250.00. 3 cyl. Rice 2 cycle 20 H.P. with A. K. Ignition, reverse propeller and shaft complete \$140.00. 10 ft. and 5 ft. lengths bronze shaft 1½ inch diameter \$15.00 and \$7.00. Hor. Gray stationary 3½ H.P. (new) \$40.00. Hyde propeller (new) 20 x 24 inches. Gordon Baxter, Palmyra, N. J.

BARGAINS BARGAINS EAGLE TWO CYCLE ENGINES

We purpose to close out at greatly reduced prices our entire stock of "Eagle" two cycle engines, as we intend to discontinue the manufacture of this type of engine in the future. Write at once for information to the

TORRINGTON COMPANY
STANDARD PLANT
Torrington, Conn.



All Sizes Rebuilt

marine engines from one to 300 H.P. 4 cylinder 4 cycle Globe 10x14" 50" 3 blade propeller, \$3,000.00 a pair 11x12 Graig's \$4,000.00. 37 H.P. Standard 4 cylinder \$1,000.00. 6 cylinder 12x12 Speedway \$200.00. 100 H.P. Graig \$1,500.00. Automatic, Buffalo, Lathrop, Sterling, Mianus, Palmers and others.

Send for complete list

HAMILTON MARINE
ENGINE EXCHANGE

440-444 Fifty-second Street
Brooklyn, N. Y.

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Cut one inch deep, one column wide..... \$ 5
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Terms: Cash with order.

Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MoToR BoatinG.



FOR SALE PRACTICALLY NEW CRUISER

(Built by Consolidated Shipbuilding Corp.)

Priced at less than one-half of today's construction cost. Would consider a smaller cruiser in part payment. Now in construction shed ready for the water.

Specifications: 67 ft. O.A., 63 ft. L.W.L., 13 ft. 6 in. Beam, 4 ft. Draught, 150 H.P. 6-cylinder, Speedway Motor, 12 to 14 miles. G. E. Independent Electric Light Plant.

2 Single and 1 Double Staterooms, Double Berth

Apply to your broker or

Can be inspected at the Yards of F. S. NOCK, East Greenwich, R. I.

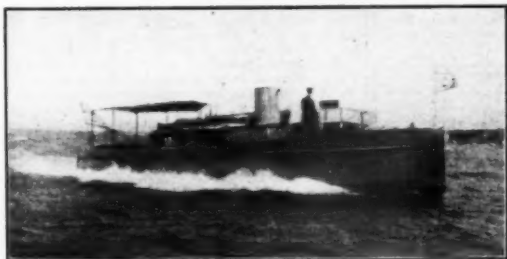
In Saloon, Dining Saloon in Deck House, Accommodations in forecabin for 4, Full Control in Semiglass-enclosed Bridge Deck, with Standing Top, 2 Boats.



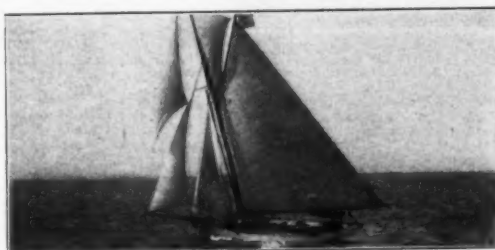
FOR SALE—30 ft. motorboat, Marblehead built, 4 years old, excellent sea boat, Gray 2 cyl. 12 H.P. engine, approx. 9 miles per hour, sleeps 4 in cabin, Curtis toilet, electric lights throughout, riding lights also, Gray & Davis generator, storage battery, power bilge pump, anchors, tender, new top, glass windows, hinge up same type as on expensive cruisers, with side curtains makes another cabin, lots of extras, folding table, etc., military mast, jib. Now at Medford, Mass. Price \$1200. Have purchased larger boat. F. E. Saunders, 87 Avon St., Somerville, Mass.



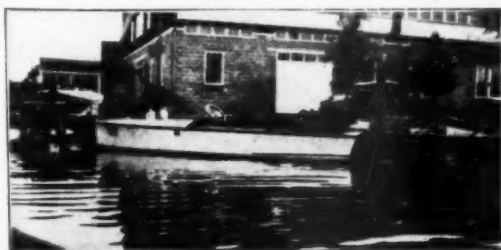
TO SAILORS OF LIMITED MEANS—Build your own motor boat power driven for all around cruising, etc., for \$5. I mail you blue prints showing plainly all plans, details, working drawings and specifications. Easy to understand and build at little cost. No experience required; you may buy the materials gradually as you need them. Length O. A. 15'-0", beam 4'-6", draught 1'-0". Whitehouse & Leitch, Naval Architects, 311 Ocean View Ave., Woodhaven, L. I., N. Y.



No. 1342—For Sale—High grade express cruiser, designed and built by Lawley, 1916. 43 ft. x 9 ft. x 3 ft. 150 h.p., 6-cylinder 5½ in. x 6¾ in. medium duty Sterling. Speed 18-22 miles. Two large cockpits, after cabin, two toilets, galley; forward cabin for paid hand. Represents Lawley's best workmanship. In beautiful condition throughout. Apply John G. Alden, 148 State Street, Boston.



No. 569—For Sale—Lawley sloop, 56 x 46 x 14 x 7. Strongly built and in best condition. Ample accommodations including double and single stateroom. Equipment complete and in good condition. Sails as good as new. Made by Ratsey in 1917. Price reasonable. Apply to the G. W. Ford Yacht Agency, 30 East 42nd Street, New York City.



For Sale—21 ft. V bottom runabout, 25 H.P. Sterling Engine, North East starting and lighting system, full automobile control, white finish with solid mahogany trim; full nicked brass equipment; autotop and side curtains. Speed about 20 miles. Used less than one season. Have larger boat reason for selling. Could not be duplicated for less than \$3,000. today. Price, \$1,600. Can be put in commission in few days. Built by Great Lakes Boat Building Corp., Milwaukee, Wis. Write or wire there.

A WORTH WHILE CRUISER FOR SALE AT A WORTH WHILE PRICE. THE BOAT IS JUST SHORT OF SEVENTY FEET LONG; HAS A DRAFT OF FOUR FEET TWO INCHES, AND IS GOOD FOR FOURTEEN MILES AND PERHAPS TWO MILES BETTER IF YOU PUSH HER. SHE IS HEATED BY STEAM AND HAS A SHOWER BATH; THREE STATE ROOMS; THREE TOILETS; AMPLE CREW'S QUARTERS; A REAL ENGINE ROOM. JUST ABOUT EVERY CONVENIENCE AND FITTING THAT ONE COULD DESIRE. SHE CAN BE SEEN NEAR NEW YORK. GLAD TO TELL YOU MORE ABOUT HER IF YOU ARE INTERESTED, BUT TO SAVE YOUR TIME AND MINE I WILL MENTION THAT HER PRICE IS FOURTEEN THOUSAND DOLLARS. P. O. BOX 214, CARLISLE, PA.

When writing to advertisers please mention MoToR BoatinG, the National Magazine of Motor Boating

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Terms: Cash with order

Opportunities for the Motor Boatman

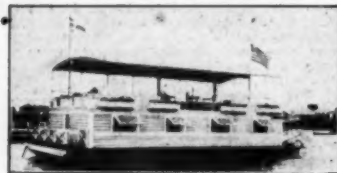
Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MoToR BoatingG.



THIS BOAT IS NOT FOR SALE

Unfortunately no satisfactory picture of the express cruiser "Quirl" is available. The boat above pictured is built by the same maker, is similar in type to the "Quirl," but instead of a canopy top the "Quirl" has a semi-enclosed steering house with glass, more port-holes, a rail around the forward deck, and in the eyes of the owner is a much better looking craft than the above picture, which is used to draw attention to this advertisement, and to give a general idea of the "Quirl."

The "Quirl" is for sale; immediate delivery; length 50 ft., beam 10 ft.; three cabins, gallery, engine room; sleeps eight people; 200 H.P. Van Blerck engine; speed 22 miles per hour; never used except for trial trips; manufacturers' covers still on upholstery; now stored under cover with Geo. B. Lawley & Son Corporation, Neponset, Boston, Mass., on a cradle ready for shipment by rail anywhere or able to go under own power. Address, Paul Watkins, Winona, Minn.



FOR SALE—No. 300. The finest House Boat of her size afloat. 40 feet long, 21 feet wide. Commodious quarters provide two large state-rooms, bath room adjoining living room, kitchen and servant's room. Numerous wardrobes, closets, etc. Her equipment is of the finest obtainable and complete in every department. This craft has had only two owners since built, and present owner spared no expense in upkeep. It is difficult to describe the many desirable features embodied in this particular craft, and she really must be seen to be appreciated. Acetylene gaslight used. Anyone looking for a Summer home maintained at little expense will do well to take early advantage of this opportunity offered. No similar craft available that can compare with her. Inspectable New York City. Address SIMON FISCH, Yacht Broker, 31 East 27th Street, New York. Telephone Madison Sq. 4008.

Latest model, 40 H. P. Lathrop engine, 4 cylinder, 4 cycle with reverse gear, magneto and coils. Price \$800. Engine used only part of one season. Wm. Schiff, 80 Maiden Lane, N. Y.

For Sale: 60 H.P. Roberts motor with clutch, coil, magneto and rings. Price \$500.00. For information write A. C. Schultze, 646 S. Leeburk St., Burlington, Ia.

Wanted: Heavy duty gas engine, three or four cylinder, from 30 to 50 horsepower, speed about 400 to 500 R.P.M. Must be in good condition. State price. Farm Products Co., Prairie du Chien, Wisc.

Companion wanted to live afloat; one who will share the expense of building a substantial motor boat, and make it our home year in and out, north in summer, south in winter, sharing the expenses together of our living, which will be small for two men, with fish, oysters, and other sea food for the taking and if desirable, take out fishing parties to pick up extra money; only those in later life should reply; be frank, state what you could do. Salt Marsh, Box 18, c/o MoToR BoatingG.

Use "SNAPPER" ENGINES for your small boat. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.

For Sale—28 ft. motor boat, 10 H.P., 2 cycle, 2 cylinder Lathrop engine. Seaworthy, excellent condition. Price \$500.00. Box 172, Vineyard Haven, Conn.

For Sale: Motor Yacht "Avenger". Built 1918. 74 ft. x 15 ft. x 4 ft. 6 in. Extra heavy construction. Flush deck type. Twin-screw. Two 70 H.P. "Sterling" H. D. Motors. Fuel capacity 1250 gals. "Delco" 110 volt generator. Speed 15 knots. For immediate sale will sacrifice. Apply to owner—Philip Wunderle, 118-132 Pegg Street, Philadelphia.

For Sale—Ferro 3 cylinder, 25 H.P. 2 cycle marine motor with reverse gear. Ignition, Bosch D. U. magneto. All in first class condition. Price \$100. E. T. Bigelow, 32 Forest St., Medford, Mass.

Solid Cork Life Preservers from U. S. Navy. Solid Cork Life Jackets, \$1.00 each. Solid Cork Life Preservers, 75c each. Solid Cork Children Life Preservers, 50c each. B. J. Green, 40 Richards St., Brooklyn, N. Y.

25 x 5½ comfortable Fay & Bowen built torpedo stern family launch for sale with new McClellan spray hood. Hull complete but without engine. Price \$350.00. Address, Wm. Burns, 325 Central Avenue, Jersey City, N. J.

CANADIANS, Second-hand engine bargains. Send for list.

GUARANTEE MOTOR COMPANY
73 Bay Street, North Hamilton, Ont., Canada

One cyl. two cycle
2 H.P. Bridgeport\$35.
3 H.P. Thrall 35.
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4 H.P. Detroit 45.
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10 H.P. Barber 6½ x 6½ 105.

Four cycle engines
2 H.P. One cyl. Dunn and propeller 40.
5 H.P. One cyl. Imperial 135.
12 H.P. Three cyl. Dunn. 95.

Also large line of auto engines, tractor and stationary engines. Supplies of every nature at very low prices. We take engines in trade and

12 H.P. Three cyl. Doman175.
15 H.P. Two cyl. Campbell 5½ x 6½, gear, wheel295.
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Two cyl. two cycle
8 H.P. Ferro\$95
10 H.P. Roberts105.
12 H.P. Gray130.
12 H.P. Detroit 95.
15 H.P. Knox, gear, and wheel195.
18 H.P. Vim 5 x 5110.
15 H.P. Page & Busch-

For Sale: Complete plant for manufacturing small marine and stationary motors, now in operation. Also equipped for machine shop. F. T. Ranney, 616 Penobscot Bldg., Detroit, Michigan.

For Sale—Sailing Yacht Outfit—Including Sails, Spars, Rigging, Blocks, Tackle, Lights, Compass and Binnacle, Steering Wheel and Gears, Shipmate Stove, Balloon Jib, New Silk Spinnaker. All formerly on fifty-foot Sloop, and in first class condition. For detailed list apply to G. G. Scranton, Harbor Beach, Mich.

For Sale—Mathews built, raised deck cruiser, 65 x 14 ft.—3 ft. x 3 ft. 6 in. Speed 10-12 miles. Built 1916. Standard engine; double ignition. Rebuilt November, 1919. Separate lighting plant; independent hot water heating plant and every convenience for extended cruising. Boat has been well kept and is now in commission; freshly painted, etc. Fully and expensively equipped. Boat has made two round trips to Florida, and is ideally suited for cruising in either Southern or Northern waters. A beautiful boat, sound and seaworthy, comfortable and commodious. As good as the day she was built, and a bargain. Don't have to sell, but will take \$15,000 cash if sold prior to April 1st. Address N. Y. L. 905 Mutual Building, Richmond, Va.

For Sale—1-7-inch Deck Type Carlisle & Finch Arc Marine Search Lamp. Brass \$50.00. 1110 14th St. N.W., Washington, D. C., Percy M. Child.

Wanted—1-1½ or 3 Kw. Direct Connected 110-volt Gasoline Electric Light Plant. Must be 4-cycle motor equal to No. 2 Carlisle & Finch Plant. Percy M. Child, 1110-14th St., N.W., Washington, D. C.

man 3 cyl. 3½ x 4 95.
18 H.P. 3 cyl. Fairbanks-Morse 4½ x 4½175.
30 H.P. 4 cyl. Termaat-Monahan 5 x 5245.
30 H.P. 4 cyl. Fairbanks-Morse 4½ x 4½265.

Standard type four cyl. four cycle engines intended for tractor work and fine for marine use.

One 5 x 7 Automatic\$350.
One 6 x 6 Model 385.
One 6 x 7 Doman new 675.
7½ x 9 Minneapolis1350.

buy them. What have you? Badger Motor Company, Milwaukee, Wisc.

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501 FIFTH AVE., at 42nd St., N. Y.

Desirable yachts of all types for sale and charter
Telephone 969 Vanderbilt

How Fast Is She?

(Continued from page 11.)

It consists of a quadrant of wood, which is weighted with lead set in its lower or curved edge, in order to keep the chip floating upright in the water, a long marked line, a sand or hour glass completes the outfit. The line is attached to the chip by a bridle of three parts, one leg for each corner of the chip distributing the pull equally. One leg is fitted with a socket and pin, both of wood, to facilitate the recovery of the chip. This is done by putting a sudden strain on the line, causing the pin to give way. The chip can then be pulled in by two legs of the bridle, offering no resistance as it no longer acts as a stop-water. The line carries no markings until about thirty fathoms from the chip, where a bright piece of bunting is tucked through the strands. This is called stray line. Its purpose is to allow the chip to get clear of the wake and eddies of the ship. The line is then marked in lengths of forty-seven feet and three inches each. This being the length of a knot derived from the proportion

3600s : 28s :: 6080 ft. : x.

This, interpreted means that the 3600 seconds in an hour bears the same relation to 28 seconds (the interval of the sand glass) as the number of feet in a nautical mile bears to the length of a knot. By multiplying the means (28 and 6080) together and dividing by the extreme (3600) the result is 47 feet and 3 inches, the length of a knot.

At the first knot a piece of cord is inserted between the strands and one knot is tied in it; the second length is marked similarly with two knots, etc. The length between each knot is divided into fifths and a small bit of white bunting is inserted to mark the fraction of a knot.

It may be appropriate to state that a knot is not a measure of distance but a rate of speed of a vessel or velocity of a current. Thus, a vessel making ten knots covers two hundred forty miles in a day.

The operation of streaming the log and obtaining the rate of speed is to insert the pin in the socket and cast the chip overboard, allowing the line to run out as the vessel moves away from it. When the red mark of the stray line passes over the rail the sand glass is turned, a stop-watch started, or second hand of an ordinary watch noted. In just twenty-eight seconds pinch the line and ascertain how much has run out. This indicates the speed of the vessel and if carefully done is very accurate.

The writer has used the chip log on several occasions when the patent log came under suspicion and by thus checking, the inaccuracy of the more modern instrument was discovered.

Should the rate of tidal currents be desired a log line may be used attached to a spar weighted so as to be submerged all but a foot or so. In this operation the spar is allowed to be carried away from an anchored vessel instead of a vessel leaving the chip. By this method most of the currents have been ascertained.

Another novel use of a log line is employed in comparatively shallow water where the lead is bent on to the log line in lieu of the chip. As the ship moves away from it the line is allowed to run out as in the ordinary streaming of the log. The speed over the bottom is thus obtained.

The chip log would not be amiss on any motor boat. It is easily constructed at home with small expense. There would hardly be a necessity of more than eight or ten fathoms of stray line, and the line itself need be nothing more than ordinary cotton stuff. It should be marked when wet.

STRONG & BEEKMAN

Yacht and Ship Brokers
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Yachts—all types, Sale or Charter; Commercial Vessels, Steamers, Sail and Auxiliaries; Plans, Specifications, New Construction.
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Offer over 200 rebuilt engines, backed by a strict guarantee, at especially attractive prices. List will be sent free for the asking. Your present engine will be taken in part payment for a new Sterling, Kernath, Gray-Prior, Wolverine, Doman, Missouri, Universal, 4 cycle; Hartford and Arrow, 2 cycle; Missouri heavy oil engine, simple and economical. Write for offer.

Jordon Bros. Lumber Co.

Manufacturers

White Cedar Boat Boards
and Cedar Products

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Nautical Instruments

underlighted Compasses,
Course Protractors, Bearing
Finders. Every navigator
should have them. Send for
interesting catalogue. Ad-
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The Oldest Paint Manufacturing Company in the
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FULL-AUTOMATIC

Lighting and Power Plants

Made in five sizes for Yachts, Boat-houses, Cottages,
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Send for the big new Matthews Book.
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are the very best. Hun-
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for marine work a specialty. Our experience in this
particular field is at your disposal. Get our estimates
before specifying on aluminum, bronze and composi-
tion castings, also drop forgings of steel and brass.

THE HARLEY COMPANY

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C.B. HAMBLÉN & CO.

(AGENTS FOR)

Gray-Prior Marine Engines

Betsy Ross Flags

Marine Hardware—Motor Boat Supplies

Write for list of second-hand engines.

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Just received a few carloads of choice Cedar. Can make immediate shipment. Good assortment of sizes. Also on hand: Oak, Mahogany and other woods for boat building.

WM. P. YOUNGS & BROS.

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Write for illustrated catalog.

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TREGO MARINE ENGINES

Two cylinders. Bore 3" Stroke 8"

12 H. P. at 400 R. P. M. 15 H. P. at 500 R. P. M. 20 H. P. at 600 R. P. M. 25 H. P. at 800 R. P. M. Some excellent territory still open to reliable dealers

TREGO MOTORS CORPORATIONBuilders of the U. S. Liberty Engines
New Haven Connecticut**Tillinghast Racing Green**

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Agents for Fay & Bowen, Clay heavy duty,
Fulton EnginesJoe's Reverse Gears, Wizard Magnetos,
K. W. Coils**Sheet Metal Battery and Coil Container**

(Continued from page 28)

bend five open rings of cardboard a quarter of an inch high and glue these on the bottom of the box for the cells to rest on and allow paraffin to flow under them. Then set the cells in place, make connections of heavy flexible wire, solder them securely, attach two long flexible leads, bring them out over the side of the box, push the other connections below the top and fill the whole box with melted paraffin. Your dry-battery troubles will then be ended for some time to come, as far as internal disorders are concerned.

Now line the galvanized container with thin boards soaked in melted paraffin, cardboard impregnated with paraffin, or other good insulating material; always selecting some material as little as possible liable to damage by moisture. Make two galvanized slides for the end of the case, one to lower the battery compartment and the other fitting over the first, the coil. Fit these slides so that the edges of the case will cover them and prevent water working in; the top slide fits over the lower so that water cannot run down into the battery compartment. If there is an empty compartment back of the coil, as shown in the sketch, another slide could be fitted on that end, forming a compartment for extra plugs or other parts.

Slide the battery unit and the coil into place and wedge in other sheets of insulating material to prevent them shifting around and the container is complete. If the slides will not stay in place by friction, simple clips of some sort may be fitted to hold them. If desired, a handle could be soldered or riveted to the top of the case to carry it by, if it has to be taken any distance from the boat when through using.

H. H. P., Oakland, Cal.

Battery Box with Brass Spring Contacts

THE accompanying sketch illustrates a combination battery box and coil which has been in use in an open boat for two seasons.

The box proper was made of one-half-inch hardwood, put together with white lead between the joints and screw fastened. The cover is held on by four hooks, allowing immediate access to the box for adjustment of coil and inspection. The carrying handle consists of a leather strap fastened with brass screws and washers under the screw head.

In the bottom of the box there is placed a piece of one-half-inch board which had been bored clear through with six two and nine-sixteenth-inch holes, as indicated in the sketch, these were to receive the bottom of the dry cells, leaving a space of about three-sixteenth inches between the cells. Fastened to the cover was a piece of one-half-inch board carrying five spring brass connectors, these being so located that when the cover was clamped in place the batteries were properly connected to each other without the use of wires. This avoids the possibility of connections loosening up and allows instant replacement of the dry cells.

The coil screwed to one side of the box as shown was connected to the battery by a wire and to two terminals which pass through the box, thus bringing all coil connections to the outside of the battery container. One side of the battery also is brought to the terminal passing through the box, thus bringing the connections for the battery ground, timer, and spark plug to three binding posts on

(Continued on page 60)

Advertising Index will be found on page 138

Roebing Launch Steering Cable

Metallic Cord Center



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Send for Folder No. A-375

JOHN A. ROEBLING'S SONS CO., Trenton, N.J.

AUTOMATIC BILGE PUMP

Keep your boat dry while at anchor

Motion of the boat works the pump

Get Order In Early Introductory Price \$17.50

A tireless worker at a troublesome job

ROCK-A-WAY PUMP CO.

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DREADNAUGHT SAFETY SUIT

For SAFETY, UTILITY and PLEASURE

Great for Duckshooting and Fishing
Kapak Swimming Belts and Canoe Cushions, \$2.35 each.
Adjustable Kapak Jacket, \$12.00.

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PURDY BOAT COMPANYDesigners and Builders of
EXPRESS CRUISERS

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SENSIBLE Safety Suit

The only ventilated and sanitary safety suit. Demonstrated and Sold at NEW YORK CITY by Abercrombie & Fitch Co., Brokaw Bros., Browning, King & Co.

Phila., Pa. and Washington, D. C., Jacob Reed's Sons
Write today for full details toALFRED VARLEY SIMS, Gen. Sales Agt.
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FREE! Sonora Semi-Permanent
replaces steel needles, play 50 to 100
times, and are used on ALL MAKES of
steel needle records. Economical, convenient,
improve tone, and preserve
records. 25c per card of 5, 40c in
Canada. Write today for FREE sample.

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George E. Brightson, President

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AVOID disaster by using
a DIRIGO compass on
that boat. All materials
first class. No rubber
gaskets to rot. A very hard
pivot and high-grade jewel.
Navy degree circle on dial.
Brass and mahogany bin-
nacles. Also new course
finder and bearings instru-
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catalog.

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INTRODUCED 1907



TRADE

MARK

REGISTERED

NEW PROCESS CHEMICAL CO.
38-41 Cortlandt St. New York City**NUPRO MARINE GLUE**

for deck seams and stop-

ping leaks in boats. Elastic.

Adhesive.

NUPRO COPPER

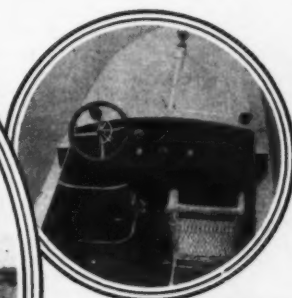
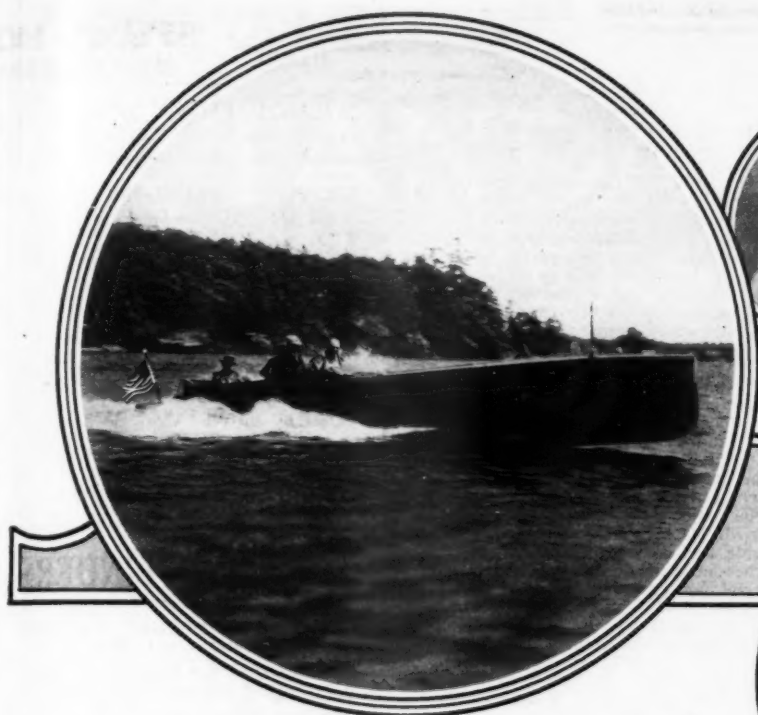
PAINTS are best for pro-

tecting wood hulls from

worms and growths.

Shiphandlers: Write for

prices.



INSTRUMENT BOARD



*"The gold of the mist in the morning light
With the sun just rising free,
Is a better gold than man can hold—
And it's mine if I'll look and see."*

Albany de Luxe Mahogany Fast Runabouts and Express Cruisers

Whether skimming the surface of quiet inland waters or driving the salt-sprayed seas of open ocean an Albany returns the maximum of boating pleasure and comfort.

The luxurious 30-foot Runabout pictured above combines the speed and seaworthy advantages of V-bottom design with the buoyant gracefulness of the round-bilge type.

Selected polished mahogany planking, decking and finish throughout; electrical equipment, with controls and instrument board like those of the finest town car; one-man top; quiet power plant developing 33 miles or throttling to scant two; wicker

chairs and deeply upholstered rest-inducing seats for seven. A masterpiece of boat construction, as satisfactory in service as it is desirable in appearance.

Sister ships in the Albany fleet comprise 26- and 35-foot Fast Runabouts, 36-, 40-, 50- and 57-foot Cruisers. Detailed information and pictures will be forwarded on request to responsible parties who state the size and class of boat which interests them.

Albany Boat Corporation

7th Street,



Watervliet, N. Y.

When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating

Battery Box with Brass Spring Contacts

(Continued from page 58)

the outside of the box. By this method all that is necessary to do to remove the battery and coil from boat is to disconnect the wires from the exterior binding post.

The detail of the spring brass connector is shown, and in this detail it will be noticed that on the flat feet of the connector at a distance of one and one-eighth inches apart the metal has been sunk in from the bottom of the feet, using a punch and a hammer, thus depressing the feet directly over the battery terminals which register with the depressions and prevent the batteries from turning and thus breaking the contact. It was originally intended to put a rubber gasket between the cover and box, but with the small cleat shown fastened to the cover, and which fits snugly on the inside of the box, there has been no trouble from water and therefore this gasket has never been removed.

The inside of the box was given two coats of black asphaltum varnish and the outside two coats of paint.

The outfit shown is for a single-cylinder coil, but it is obvious that by changing the dimensions of the box to accommodate the coil a box for a multi-cylinder engine can be constructed.

E. J. S., Springfield, Mass.

Yard and Shop

(Continued from page 42)

boatmen, and it would be advisable to write to your Senators and Representatives informing them that this bill meets with your approval. Under the provisions of this bill, the possession of any motor vehicle without a Federal certificate of ownership would be prima facie evidence of the illegal possession of the said motor vehicle.

Boston Motor Boat Show Soon

Beginning on March 27 and continuing until April 3, the New England Engine and Boat Association will hold a Motor Boat Show in Boston.

The prospects seem very bright for a grand show, particularly in view of the unprecedented success of the New York Show which has just been concluded. MoToR BoatinG plans to be represented and will welcome its many friends from New England at the Show.

Hall-Scott Eastern Offices

In connection with the campaign to introduce Hall-Scott marine motors on the Eastern seaboard an Eastern sales office has been opened in Buffalo, N. Y. At this office it is proposed to carry a complete assortment of motors and spare parts and center the activities of the service department here. The central location of this office will make it readily accessible to most of the Eastern territory and will afford prompt service in case of need. An elaborate service department is to be organized and the office will be under the able direction of A. J. Utz, who has recently joined the forces of the Hall-Scott Motor Car Co., of Berkeley, Cal.

Gray-Aldrich of Boston

Acting as agents for Wolverine, Van Blerck, Lathrop, Fairbanks Morse, and Palmer motors, the Gray-Aldrich Co. Inc., of Boston, Mass., will display a full line of these motors during the Boston Show.

Advertising Index will be found on page 138



**Wrenches
Deliver 30%
More Service
for
5% Greater
Cost**

Why buy a substitute or an imitation?

**AT ALL RELIABLE
HARDWARE STORES**

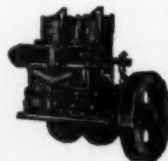
COES WRENCH CO.
WORCESTER, MASS.

SPRAY-HOODS BOAT CUSHIONS

ATLANTIC-PACIFIC MFG. CO.

124 Atlantic Ave.

Brooklyn, N. Y.



REX MARINE ENGINES

Two Cycle—Two Port Type

1 cylinder, 1 1/2 H.P. 6 H.P.

2 cylinder, 3 H.P. 12 H.P.

3 cylinder, 4 1/2 H.P. 18 H.P.

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NEPONSET ENGINE & MACH. CO.

Boston 22 Mass., U. S. A.

"New Jersey" Marine Paint(Specialties

Used by All Who Want the Best
Top and Bottom Paints for Everything
That Floats

Manufactured by

HARRY LOUDERBOUGH, Inc.

New Jersey Paint Works, Jersey City, N. J.

SCORED CYLINDERS

Repaired without regrounding by the

Lawrence Patent Process

Scores and defects filled with a silver-nickel alloy,

electrically fused, and refinished equal to new.

Write for details. Shop licenses are available

L. Lawrence & Co. 292 HALSEY ST. NEWARK, N. J.

Service Plants in the principal automobile centers

"Reliance" Steering Gears

AND

30 Styles Deck Controls

The Proper Wheel
for every type
of boat



Write for Literature
W. S. HALL CO.
Rochester, N. Y.

WE CAN MAKE PROMPT DELIVERY OF
NEARLY ALL SIZES OF THE FAMOUS
EMERSON 2 CYCLE
4 PORT

AT THE OLD PRICE

HERFURTH ENGINE & MACHINERY CO.
Alexandria, Va.



DELCO-LIGHT MARINE SET

A complete electric light and power plant—
independent of the boat engine. Runs on
kerosene. Compact, easily installed; 70 000
satisfied users. Write for catalog.

DELCO-LIGHT CO.

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OHIO

BUILD YOUR OWN BOAT



—Cruiser, work
boat, open
launch or row-
boat—from our
knock-down
frames or pat-
terns. Save 1/2
to 3/4 the Cost.
Catalog on re-
quest.

DEFOE BOAT & MOTOR WORKS

3218 State St.,

Bay City, Mich.

THE STANDARD REVERSE GEAR

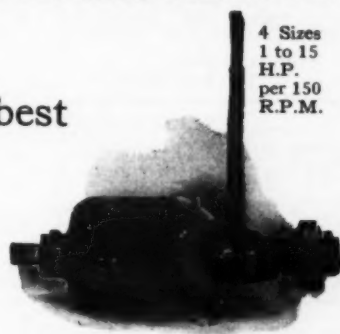
SETS the standard for all reverse gears. Motor boats numbering more than 30,000 of all sizes and shapes are equipped with Standard Reverse Gears.

Being built for service these gears will outlast your boat.

A Standard Reverse Gear is strong, perfectly quiet, clean and trouble-proof—runs in oil and takes but little space in your boat.

If you want to know about the best reverse gear built—

*Write today for new
catalogue and prices*



STANDARD GEAR COMPANY

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MICHIGAN

FOR SALE**U. S. Shipping Board Paints and Varnish**

Toch Bros Camouflage Black, 4 Bbls.@ \$2.00 Gal.
 Toch Bros. Battleship Grey, 5 Bbls.@ 3.00 Gal.
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 Woodfiller, 1 Bbl.@ 1.25 Gal.
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 Guaranteed as represented sold F. O. B. Warehouse, N. Y. City, N. Y.

OBERLE DISTRIBUTING COMPANY
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Baldrige Reverse Gear
 You can get a Gear
 original all-enclosed, time-tested reverse gear—now—for immediate delivery.
 Booklet "For the Man in the Boat," Free.
 THE BALDRIDGE GEAR CO. Boston, Mass.

"CURTINMADE"
 Canvas Goods
JOHN CURTIN
 CORPORATION
 Reg. U. S. Pat. Off. 48 FRONT ST. NEW YORK

Quayle Oil Engines
 FOR MARINE SERVICE
COMMONWEALTH MOTORS CO.
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IMPROVED THERMEX SILENCER
 Increases Revolutions, No Back Pressure!
 Cannot clog, nor collect salt; water cannot flow back to cylinder. No heating, no odor. Used free or under water—adjustable discharge. Lightest, cheapest to install. Free booklet shows why. Send for it today.
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CALDWELL PLIERS, SCREWDRIVERS
HACK SAW FRAMES, CHAIN TOOLS
"BURRO" High-speed Hack Saw Blades
"BURRO" Flexible Metal Band Saws
"VISCO" Hack Saw Blades
BURWIN CO., Inc.
 87 Warren Street New York, N. Y.

RUNABOUTS

10, 22 and 25-Footers Standard Models
 Complete with Power and Equipment or Hulls built to order complete at very reasonable prices. Dinks, Power Tenders and Row Boats
BADGER MOTOR BOAT CO., Inc.
 Address, Lake Ave., Cor. 4th St., Racine, Wis.

BLOOD BROTHERS
UNIVERSAL JOINTS
 Absolutely Dependable
 Do Not Throw Grease
Blood Bros. Machine Co.
 Pioneer Makers of Universal Joints
 Allegan, Mich.

Coming Alongside With a Launch

(Continued from page 25)

her bow wave. Just aft of the turn of the bow wave you will note a hollow, and the best place to come alongside will be directly aft of that hollow. Run up parallel with her and some little distance off the lee bow and then pass a heaving line to her. Take a turn around a bitt or cleat on your own fore quarter and gradually slip the clutch until the speed of the launch is slightly lower than the speed of the vessel. This will cause the launch to be brought nearer. By letting out on the turn of the line you will be able to regulate it so that you will finally touch the side at the point directly aft of the hollow. In a case like this always keep your own engine going and if possible a man at the clutch as well as one at the line. In getting away you must shoot ahead and out as quickly as possible; never letting go of the line until you have taken up all slack and are safe from going aft and into the propeller race of the ship.
 G. T. W., N. Y. C.

Some Daily Experiences in Boarding Vessels

(Continued from page 25)

the launch "sticks" tight while the boarding officer and party grasp the ladder and climb clear. Some practice is required to keep a launch under such circumstances at relative speed, and this is best accomplished by watching a section of plating abreast the launch, increasing or decreasing revolutions of the motor as may be necessary. In getting away from the ship all that is required is to sheer off with throttle opened. When a launch takes a tow from a ship the usual practice is to make fast with line well forward, say from the forecabin head, and sufficiently long to permit the launch to ride at, or just forward, the bridge. Then, by manipulating the rudder so as to tend her away from the ship, the launch goes easily when speed is under eight miles an hour and, casting off, is well clear. The towline must lead from forward, however, and be of good length. Under no circumstances should it be made fast on the launch without provision for immediate release should an emergency arise.

When a ship swings at anchor in open water very little risk is encountered putting a man aboard, the main thing to be considered being sufficient fenders in case the water is boisterous. Anchored ships, as a rule, have accommodation ladders which must be closed in so as not to catch one's launch under the grating and held clear with a boat hook forward and aft while the boarding takes place. With the rope ladder down the launch runs up to it and is held there with the motor or by means of a line belayed in such manner that it may be cast off in a jiffy. One should forelay for currents and wind when undertaking to board a ship from a small boat whether the big fellow is steaming or anchored. An eye must be kept on the propeller when in proximity of the stern because even anchored ships have the habit of turning over on the screw when least expected. And crossing the bow, look out for the cable or the current may set the launch against it, despite all one may do if the wind is contrary.

Remember, too, never to board a ship from a foreign country unless the port physician and customs official have attended to their duties, otherwise you are liable to a heavy fine.

G. S. H., Boston, Mass.

Advertising Index will be found on page 138

BILGE PUMPS

Copper or Galvanized Steel—2 to 4 inch diameter—any length. Also Sectional Pumps with removable valve.

Write for prices. Discounts to dealers.

BLUE & QUERPEL CO., 230 Third Ave., New York City

BURGER BOATS
COMMERCIAL AND PLEASURE

If you plan to build a new boat this spring it will pay you to get our prices.
 We are prepared to furnish any boat up to 300 feet for all purposes and we guarantee satisfaction.
 Write for information

BURGER BOAT CO.
 Manitowoc, Wisconsin



You Can Build Your Own Boat
 and save 2/3 the cost by the BROOKS K. D. SYSTEM.

Send for catalogue showing all models.

1101 RUST AVE. SAGINAW, MICH.

BROOKS MFG. CO.,

ENJOY
 the LURE
 of the
 WAVES

K D or
 Complete

RICHARDSON BOAT CO., No. Tonawanda, N. Y.

Topping Brothers
EVERYTHING IN MARINE HARDWARE

122 Chambers Street, New York
 ESTABLISHED 1885

Every boat should be equipped with the famous Ever-Warm Safety-Suit

—one for everyone on board. Ocean voyagers should ask about our rental plan.

Some Territorial Agencies Still Open.

NATIONAL LIFE PRESERVER COMPANY
 11 Broadway New York City

W. J. TIEBOUT
Established 1853**MARINE HARDWARE**

118 Chambers St., New York

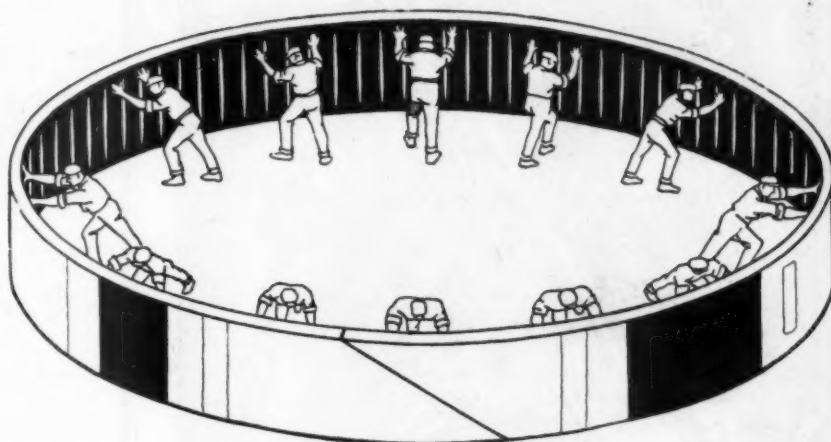
Practical Motor Boat Handling

A handbook of information about boats and boat handling which every boat owner should know. It constitutes a complete and comprehensive but non-technical guide upon which you can rely from the time you leave your anchorage until you return, regardless of what emergencies may arise. Written by Chas. F. Chapman, M.E., editor of MoToR BoatinG, \$1 per Copy.

Why The Outward Radial Pressure Is Equal At All Points

on

THE WASSON PISTON RING



Firms Who Use WASSON Peened Concentric Piston Rings

Marine Engine Mfgs.
NEW LONDON SHIP &
ENGINE CO.
McINTOSH AND SEY-
MOUR CORP.
GRAY MOTOR COM-
PANY
MIANUS MOTOR WORKS
STANDARD MOTOR
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FULTON IRON WORKS
WORTHINGTON PUMP
MACHINERY CO.
J. W. LATHROP ENGINE
CO., Inc. and others

**Air Boat and Aeroplane
Engine Mfgs.**
HISPANO-SUIZA EN-
GINE
LIBERTY MOTOR
WRIGHT-MARTIN AIR-
CRAFT CORP.
PACKARD MOTOR CAR
COMPANY
TREGO MOTOR CORP.
DUSENBURG & CO.

Only one factor could decide
such leaders to use the Was-
son, and that is Performance.

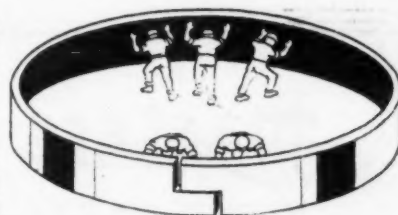
WHEN the Wasson Piston Ring is fitted to the groove in the piston it almost fills it; moreover, it stays in that position. There is no open space back of the ring for oil or carbon to accumulate.

Look at the dents on the inside of the ring. These are made by an automatic hammer which permanently expands the inner surface of the ring in such a manner that the outward radial pressure is equal at all points, all the time.

Forms Gas-Tight Joint

THIS outward pressure insures equal charges to the cylinders and constant working pressures. It presents a uniform bearing surface, both to cylinder walls and to the piston ring grooves.

In contrast to the Was- son positive scientific principle, the illustration to the right shows the ill- fitting eccentric style of piston ring which has un- equal radial pressure. This design leaves a space between the inner wall of the ring and the bottom of the piston groove, which forms a repository for carbon and also provides an outlet for compression.



Marine motors equipped with Wasson Piston Rings run evenly and smoothly in low speed or high gear. They reduce friction and increase power.

Manufactured by

WASSON PISTON RING CO., Plainfield, N. J.

Sales Office: Lake Sales Co., 1947 Broadway, New York City

CUT RATE MARINE SUPPLY HOUSE

Everything for Motor Boats



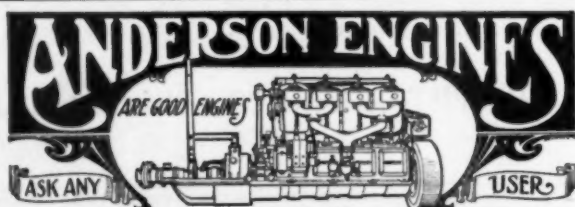
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E. J. WILLIS CO. 85 Chambers St. New York City

Masters
AUTOMOTIVE ACCESSORIES

Boatmeter
Oxifor
Tachometers
Gasoline Gage

MASTERS MANUFACTURING CO.
7 WOOLSEY SQUARE, JAMAICA PLAIN, BOSTON, MASS.



Main Office: 4032 No. Rockwell St., Chicago, U. S. A.

Advertising Index will be found on page 138

Standardization Finally Reached

(Continued from page 8)

stood in line at the foot of the gangway until earlier arrivals had made their inspection, you were permitted to go aboard and learn for yourself that the cruising arrangements were complete from galley to self-starter. And you could hear from the lips of a convincing gentleman with a silver button in his lapel that this arrangement of the Cruisette was only one of several that have been standardized by the Elco concern for a hull of 32-foot length. As an earnest of the variations that could be effected in one hull by a concern which has specialized in quantity production, you were invited to move forward and see the open model of the Cruisette—a craft with an enclosed motor centrally located and several acres of seating space around it.

Next in order in the 32-foot class was a standardized trunk cabin cruiser offered by the Red Bank Yacht Works, of Red Bank, N. J. This was another big boat for its dimensions, its 36 h.p. Red Wing motor tucked away under the cockpit and separated from the cabin forward by a gas-tight bulkhead. Such features as a built-in ice-box filled from the deck, and a 50-gallon fresh water tank commended it to the feminine element among the sightseers, while the buying contingent was gratified to learn that the selling price, complete with motor, self-starter, and full equipment, was no more than \$3,900. A speed of 12 miles and a seaworthiness vouchsafed by the dory-like lines of the lap-streaked hull made a generally good impression.

As you tacked diagonally across the floor there hove in view the two 32-foot models of the International Shipbuilding & Marine Engineering Corp., of Nyack, N. Y., and here again the visitor was constrained to stop and wonder how so much roominess could be achieved in a boat of this length. The International Thirty-two's were shown in a cockpit model having a large cabin forward, and in a bridge-deck design with two separate cabins. The two are priced at \$3,500 and \$4,000, respectively, and one sweet enthusiast who had inspected the cockpit model first and adjourned to the bridge-deck of the other was heard to remark to her indulgent father, "What's \$500 extra, dad, when you've already agreed to spend \$3,500 for the cockpit model?" What, indeed, is \$500 nowadays? If you don't give it to your favorite boat or engine builder, the local butcher is liable to come along and take it for a pound of tenderloin steak, weighed in the wrapping paper.

On the opening day of the show, old-timers missed the sleek perfection of Lawley, Luders and other luxurious craft. The blizzards which hit New York in February every day the weather forecaster guessed it would be fair and warmer caused these gaps in the ranks of the boat exhibitors, and numbered among the missing several motors as well. The 50-foot Luders day cruiser, after adventures which would have taxed the resources of an Arctic explorer, was brought to the port gangway of the Palace on Saturday night after the opening, and

(Continued on page 92)

Gray Marine Motors for 1920

PRODUCTION Increased

Overhead Valves

This is the day of overhead valve motors. All the aeroplane motors—also the Reo, Marmon, Chevrolet, Buick, Nash and a host of others have adopted the overhead valve—it is more efficient, more powerful and more accessible.

Back-firing

This motor cannot backfire and set fire to your boat.

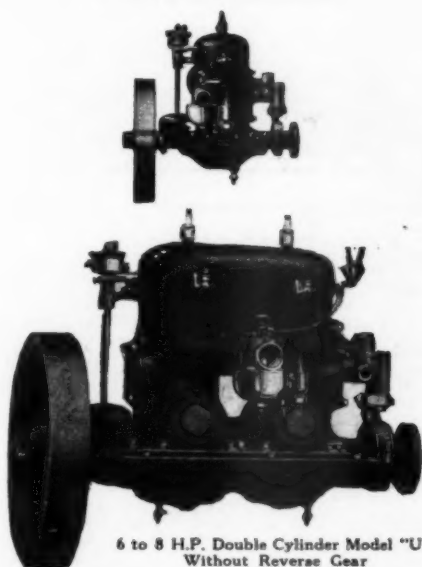
Kerosene or Gasoline

All gasoline now is poor stuff, the motor designed five or six years ago uses it, but not satisfactorily. It takes a different design of intake to properly use this low grade fuel. Our HOT SPOT cylinder head uses not only gasoline of the poorer grades, but even kerosene and gives absolute control, flexibility and a clean motor.

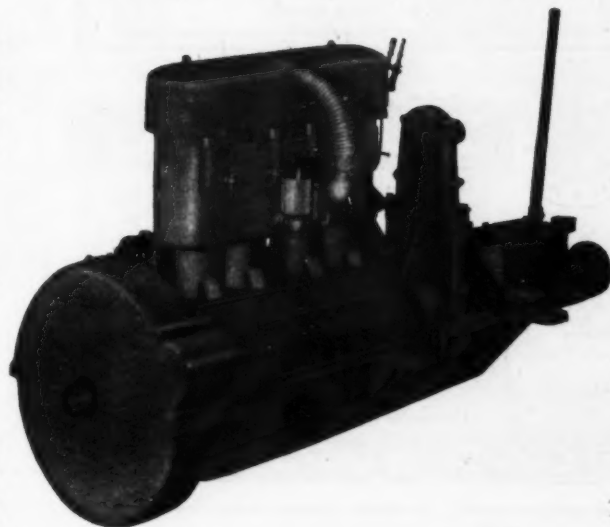
Gray 2 Cycle—3 to 8 HP.

Standard the world over.

Reliable—Economical.



6 to 8 H.P. Double Cylinder Model "U"
Without Reverse Gear



This model "VM" Gray 4 cycle motor marks an epoch in Marine Motor history. In this motor is embodied the results of the most modern gasoline motor practice and backed by an old established motor building organization and its experience.

Slow Speed 500 to 600 Rev.—10 to 12 HP.	Medium Speed 700 to 900 Rev.—15 to 20 HP.	High Speed 1000 to 1200 Rev.—20 to 26 HP.
---	---	---

Guaranteed for Work and Pleasure Boats

Gray 4^{Cycle} Cylinder Motors

In three sizes 10 to 50 HP.

all valve-in-head

write today for 1920 literature

Gray Motor Company

Detroit, Mich.

2106 Mack Avenue

Freeport Engine Co

450 Freeport St
Dorchester, Mass.
Engine Repairing and Overhauling
of the highest class

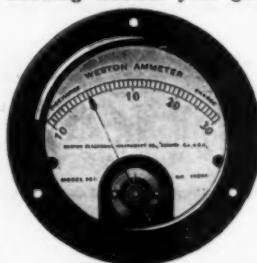
Send Us Your Repair Work

We do nothing but engine repairing and we do it right. We make any part for any engine or complete engine to your order. We use only the best material and workmanship and give quick service. Send us your engine to overhaul and it will be as good as new. We do cylinder grinding, welding, etc., and maintain a repair and tow boat that goes anywhere within fifty miles day or night. We have a few second-hand engines that are real bargains.

Tel. Dorchester 5873M.

What About Your Battery?

Upon its condition depends the successful running of your motor. There is one sure and dependable way of knowing whether your generator is working and your storage battery receiving its proper charge. Put a



Weston
MODEL 381 AMMETER
On Your Bulkhead

and you will have the only absolutely reliable means of knowing whether you are maintaining the proper condition of your battery. Easy to install. Write us!

Weston Electrical Instrument Co.
28 1/2 Weston Ave., Newark, N. J.



ZUNDEL

We carry the most complete assortment of motor boat supplies in New York. Everything in the line of

MARINE HARDWARE

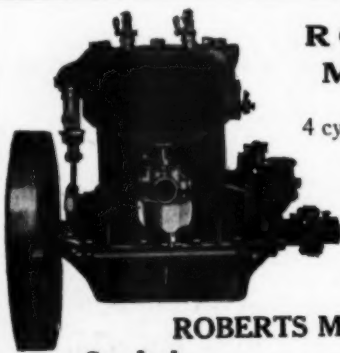
Ship Hooks	Cleats, Hooks & Eyes	Manhole Plates	Lavatories
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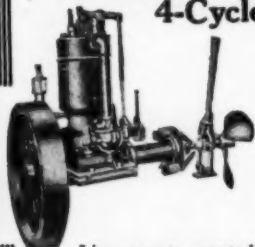
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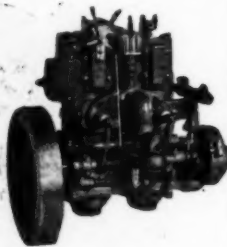
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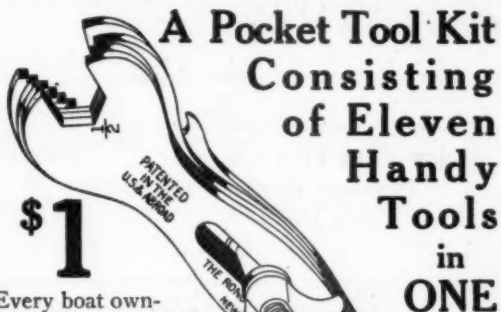
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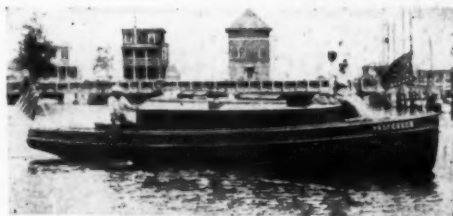
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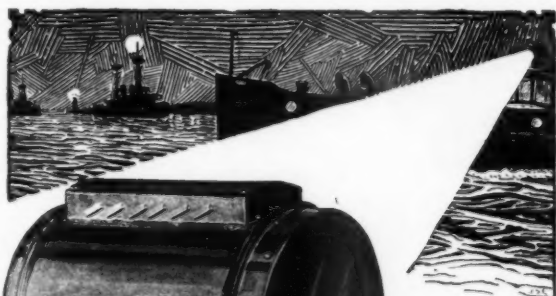
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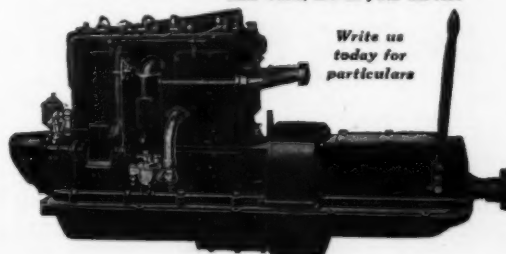
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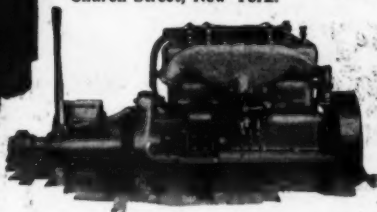
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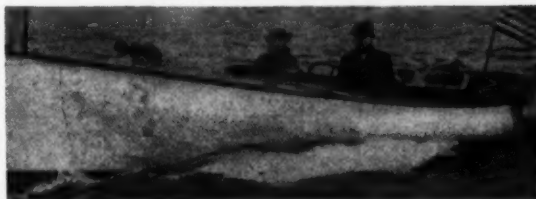


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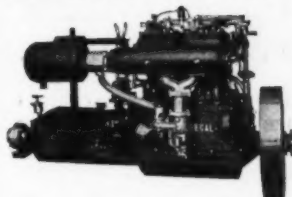
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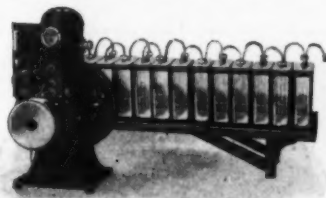
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Not
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April MoToR BoatinG is the Annual Fitting-Out Number, which reaches its readers just before they get ready to overhaul their boats, engines and equipments for the coming season. Every class of product on the marine market is in demand at this time of the year. Millions of dollars in the aggregate will be spent for supplies, repairs and replacements.

Are you going to get your share?

WHEN BUYERS BUY

This is the time when every boat owner is an active buyer—a live prospect for everything needed on or about a boat. Throughout the winter he has been planning improvements and getting ready for the Fitting-Out season. This is the opportunity to reach him with your selling message before he spends his appropriation for new equipment and supplies.

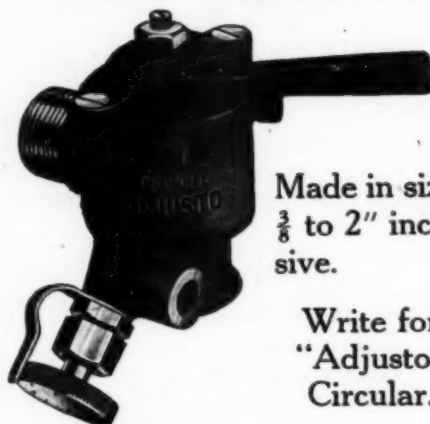
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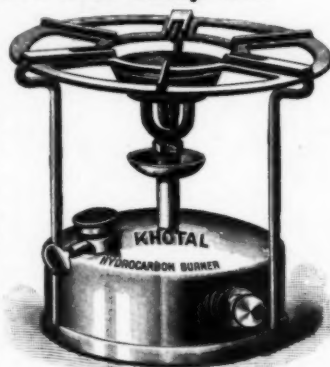
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Closet

Figure
1404

Dimensions: 18
x 18 x 11" high
to top of bowl;
2 1/2" cylinder.
For above or
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The best little closet on the market today, possessing many of the advantages of the large size toilet. All brass and porcelain. Oak seat and cover. All prices subject to market advances, which are continually changing.

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Pioneer Specialists in Marine
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The Curtiss line is exceptionally complete, varied in type, size and price to meet every possible requirement. Each model has been designed in accordance with our wide experience in boat work and can be depended upon in quality, service and durability no matter whether it is our highest or lowest priced model.

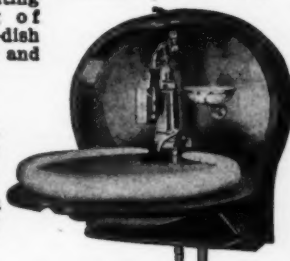
"PRICES ON APPLICATION"

With Pump

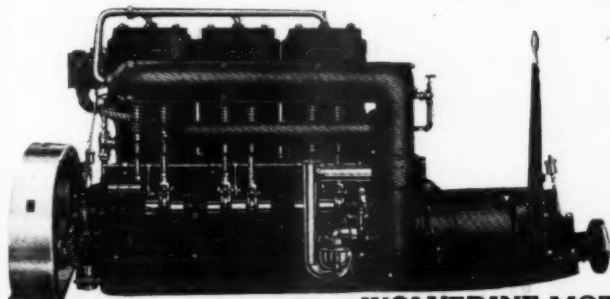
Cock on pump swings upward, thus preventing breaking of bowl. Soap-dish is porcelain and removable.

No. 5
Height, 19 in.
Width, 19 in.
Depth Closed,
6 inches.
Quartered Oak
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Lining and Fixtures
Nickel-plated. Porcelain Bowl. Mahogany or Quartered Oak Case.



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The Motor with the Bore and Stroke
HEAVY DUTY MARINE ENGINES

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for 15 years.
Device built into
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is constructed on scientific principles by skillful workmen. Its action, accuracy and steadiness are guaranteed under all conditions. Built to withstand the jars of power craft, the dial is adjusted to remain steady in a sea way and responds quickly to a change in direction. Every Compass carefully tested before shipping. 2, 2½, 3, 4 and 5 inch dials. At your dealer's or write us.

Send 20c in stamps for celluloid Course Protractor, "Compass Talks and Tests" sent free. Tells how to box the compass, contains deviation tables, and other practical information for compass users.



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THE ONLY SCREW HOLES IN THE WORLD



You drive the screw holes with a hammer in any material.

The screw holes are made for wood screws or machine screws to fit all sizes of screws. The head is removed and you leave a permanent screw hole.

The Stine Screw Holes Co.
Manufacturers
WATERBURY, CONN., U. S. A.
DEPARTMENT 21

Once a Screw Hole, Always a Screw Hole

The Biggest Little Thing in the World

Some of the Reasons Why Screw Holes Will Be Bought and Used and Not Become Dead Stock for Anyone

- 1-They can be used without damage to receiving material.
- 2-They enable you to standardize to wood or machine screws in all material.
- 3-They are made of brass and will not rust under atmospheric or moisture conditions.
- 4-ECONOMY-They save more time value than the holes cost.
- 5-You get them for nothing and are paid for using them when you count time saved.
- 6-Screw holes have been needed ever since the first screw was used.
- 7-Special tools are NOT needed in using them in any material.
- 8-They can be used in any place a screw can be used.
- 9-By using screw holes, screws can be used in many places, and in many materials where it is impossible to use screws without them.
- 10-These are the only ready-made screw holes in the world.
- 11-No special screws are needed. These screw holes fit any wood screw or machine screw now in stock.
- 12-They make the easiest possible job in any material.
- 13-Every store where screws are sold must carry them in stock, because the line of screws is not complete without screw holes for them.
- 14-Every shop and factory where screws are used must also have these screw holes to fit the screws.
- 15-They are endorsed by all dealers in screws and by all users of screws.
- 16-Screw holes are entirely new and the world supply is yet to be furnished.
- 17-This is a progressive Old World of ours, and every active person in it must adopt all improved methods, and all new articles that will help him keep in the front line of progress.
- 18-Be among the first to stick up in screw holes if you are a dealer in screws.
- 19-Be among the first to install screw holes in your shop or factory, as you begin to save money soon as you use them.
- 20-In spite of the high cost of brass, screw holes are yet cheap.
- 21-We are letting the world know that screw holes can now be secured, by means of extensive advertising in all the principal Trade Journals that have the largest circulation among dealers in screws as well as users of screws.
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- 23-They make everlasting holes in any material.
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- 25-They are the result of Necessity being The Mother of Invention.
- 26-Anyone who can drive a nail can use screw holes.
- 27-Send for a sample and convince yourself.
- 28-Mechanics who see them say, "What do you think of that?"
- 29-In fact there are NO REASONS why screw holes should NOT be used.

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27 Foot Cabin Cruiser




We build all sizes and types, but have made a specialty of this design.

CONSTRUCTION and workmanship is the best—equal in every respect to the high class of yacht work on which our reputation has been based for over 20 years. The lines are very fast, the launch is safe and able in severe conditions of wind and sea, and it has a large cockpit and very comfortable accommodations below decks. It is equally adapted to day service or cruising.

STEARNS & McKAY CO.
MARBLEHEAD, MASS., U. S. A.

Advertising Index will be found on page 138

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J-8	6x6 163-215 H.P. @ 1000-1500 R.P.M.—Rebuilt Monroe	2000.00
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4-cyl. "B"	Tractor 5¼x7 31-95½ H.P. @ 400-1300 R.P.M.—New—Monroe	800.00
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J-8 RH	6x6 163-215 H.P. 1000-1500 R.P.M.—Used—New York	1000.00
J-8 LH	6x6 163-215 H.P. 1000-1500 R.P.M.—Used—New York	1000.00

All prices net f.o.b. shipping point, and motors are subject to prior sale.

Van Blerck Motor Company
MONROE, MICHIGAN

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Rochester 45-Foot Enclosed Bridge Cruiser.

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Rochester "Bilt-Rite" Cruisers

It gives detailed information, photographs and plans of the finest 40 and 45 footers afloat. You have studied all the old designs published but haven't made up your mind yet. When you are fully informed as to our product you will easily settle the question, for every requisite of the cruising enthusiast has been provided for in our designs. They are all boat and fully found in all the necessities of life afloat. Our wonderful deck cabin makes for pleasure every day aboard and you can lengthen your season by two months as protection against disagreeable weather is fully provided.

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1920 Models—Kerosene or Gasoline Fuel

Single Cylinder
2 H. P.
\$42.50



Bore—3 3/4"
Stroke—4"

Our Prices Speak for Themselves

If you want a reliable economical motor at the lowest possible cost you should own a Dunn Motor. Compare the prices of Dunn Motors quoted on this page with the prices of any other motors in the market. Then write us for full information about the design features of Dunn Motors and how they are built.

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What A Dunn User Writes

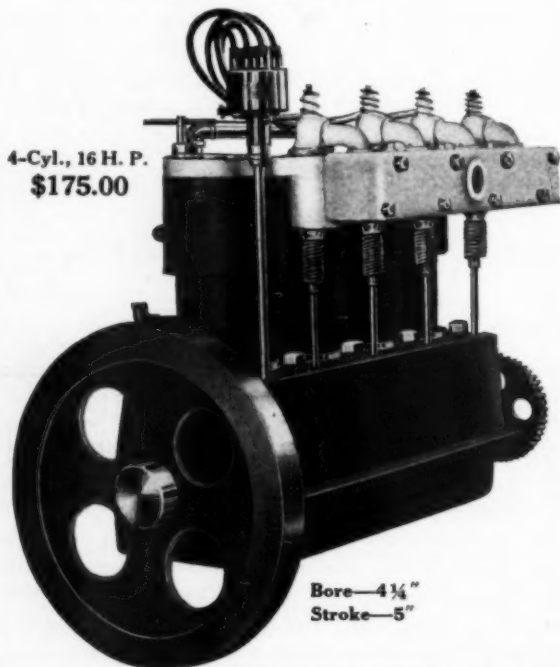
"This is to certify that about 10 months ago, I purchased one 12 H.P. Dunn Motor which I had installed in my cabin cruiser, 33 1/2 ft. long by 9 ft. beam, full model boat, and I use this boat in outing trips and have made as high as 200 miles without a stop. It works beautifully, and my little boy, 13 years old, can and does start motor without any trouble. This motor runs smooth and easy, in fact, is as smooth running as any automobile I have ever used. I consider it the best marine engine made." (Signed) Dr. G. H. Howard.

At the prices given, each motor is furnished complete with suitable propeller, shaft, couplings, coil, spark-plugs, mixing-valve and oil-cups.

Customers abroad—Add 10% to prices given to cover cost of boxing thoroughly for export and delivering F. O. B. Steamer New York City.

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4-Cyl., 16 H. P.
\$175.00



Bore—4 1/4"
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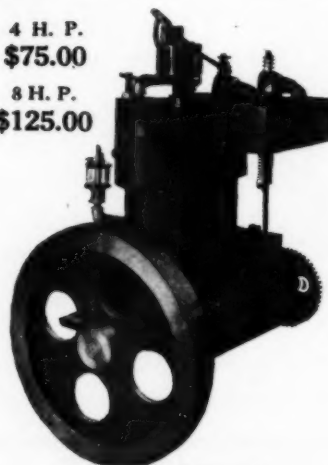
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3 Cyl. 6 H. P. and
3 Cyl. 12 H. P.

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Stroke—4" Stroke—5"

4 H. P.
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2 Cyl. 4 H. P. and
2 Cyl. 8 H. P.
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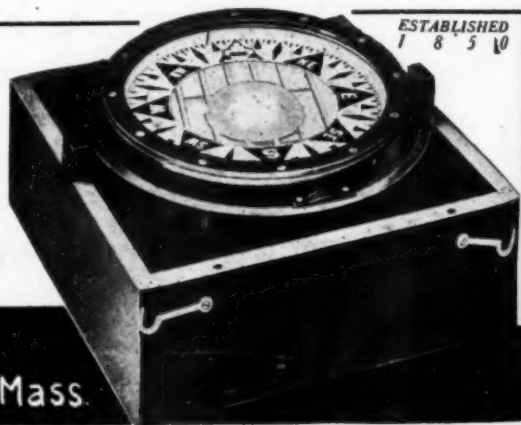
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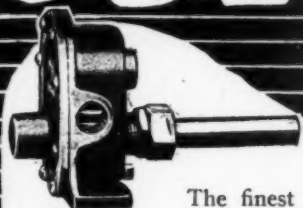


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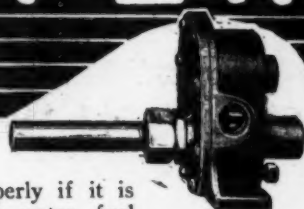
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OBERDORFER PUMPS



TYPE-A
FORM-Y

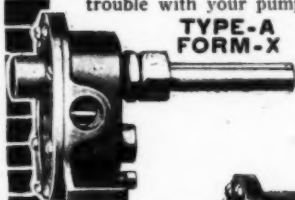
The finest power plant made will not operate properly if it is equipped with an inferior pump, whether it supplies water, fuel or oil.



TYPE-C
FORM-Y

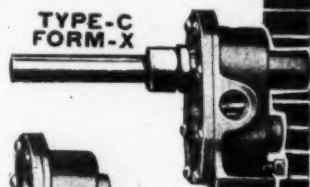
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are built especially for marine use—they are made to withstand the hard service encountered in use on board boat—Oberdorfer Bronze Geared Pumps are noiseless, automatic, compact and reliable. The supply of water, fuel or oil is governed entirely by the motor—there is never an over or under supply. If you have ever had trouble with your pump you will find a world of satisfaction in the trouble-proof Oberdorfer.



TYPE-A
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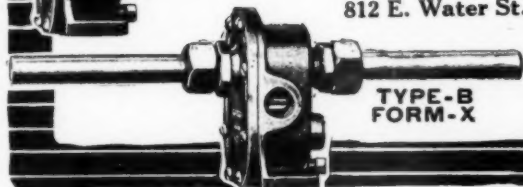


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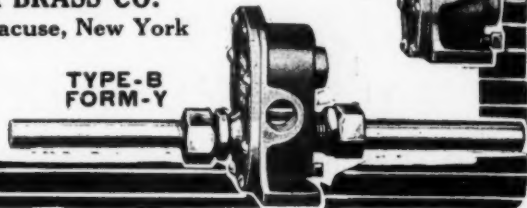
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Keeps Engine Trouble Away

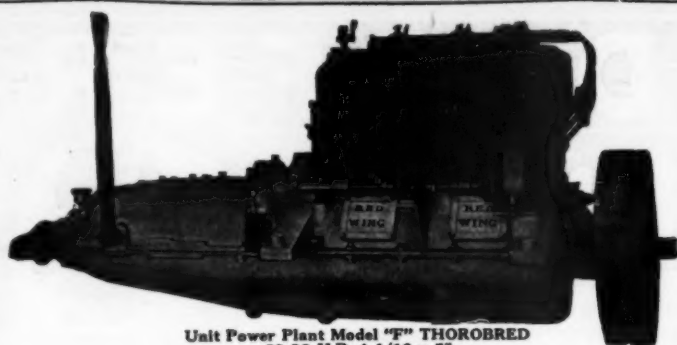
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With a Boyce Moto-Meter aboard, you are never in doubt as to what is going on in the engine. The least change in the performance of the motor is instantly registered on the Boyce Moto-Meter dial, right before your eyes.

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Unit Power Plant Model "F" THOROBRED
28-36 H.P. 4 1/16 x 5"
Furnished with or without Unit Power Plant

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You too, will praise your THOROBRED.

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DEPT. B

Red Wing, Minn.

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THERE IS NO MYSTERY
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TALBOT STEAM UNIT



It is EFFICIENT because it is a single, self-contained unit within which both high temperatures and high pressures are produced and safely maintained. Engineers are agreed such an apparatus assures maximum efficiency.

It is the most COMPACT steam plant on the market in proportion to horse-power produced. Occupies about the same amount of space as a gasoline engine.

For ECONOMY in operation a Talbot steam plant is without an equal. A Talbot plant burning crude oil will, in the course of 300 working days, practically pay for itself in the saving of fuel alone.

A Talbot steam plant is SAFE because it has no water level; no steam dome; no mud drum nor any other large pressure container. It cannot explode in a manner to endanger lives or property.

Standard Sizes, 25 to 1,000 H. P.

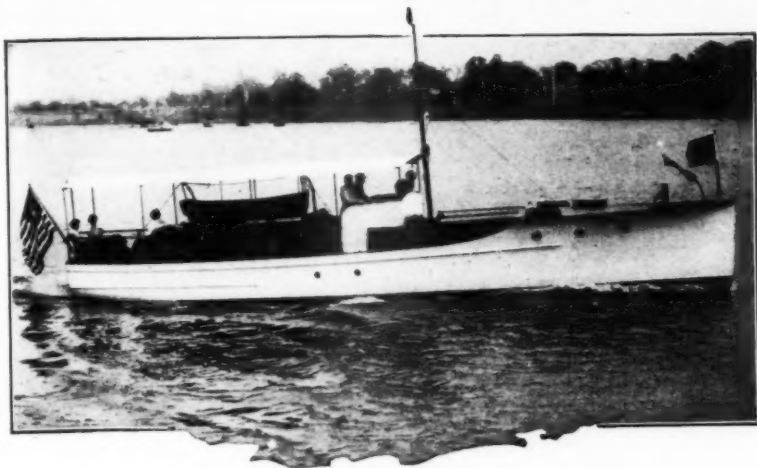
Write at once for our Bulletin "B" and give such particulars as will assist our Engineering Department.

Dealers—we have some desirable territory open for representation. Write us for our agency proposition. "SUPER-HEATED STEAM THE ULTIMATE POWER."

TALBOT ENGINEERING CORPORATION

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New Type Standard Engined Boats

IN 1910 The Elco Company got out a standardized stock 50' Cruiser. War's lessons intensified their consistent work of refining and developing this boat and equipment. Immediately after the War a systematic series of tests were made to get that *last mile* more speed. An engine of one make was installed in the boat, and trial runs were made and complete data recorded. That engine was then taken out and another make installed, in the same hull, when the same tests were made again, and so on. In this way an additional *knot* was discovered, with the new type 50 HP STANDARD Engine; and with this the satisfaction of wonderful economy, dependability and cleanliness. The new type STANDARD engine is now standard equipment for maximum power in this stock boat.



A good many years ago The Mathis Company originated their now well-known Semi-House Boat type in which they have specialized so successfully and standardized into a stock boat. Their's has been a consistent, persistent development of an idea meriting success.

Many engines were tried during the years of evolution, but for some time their standardized equipment has included the Standard Engine.

And now with an 80' x 18' x 2' 9" boat, and two new type 70 HP Standards, the remarkable cruising speed (House Boat) of almost fourteen miles per hour is realized.

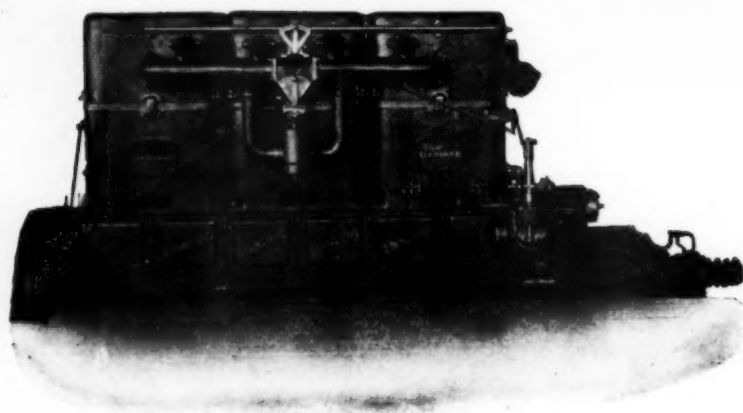
The new type STANDARD Engine is now standard equipment, for maximum power with limited draught, in this stock boat.

Back of the STANDARD guarantee is the

STANDARD MOTOR CONSTRUCTION COMPANY
178 Whiton Street

Jersey City, N. J.

Advertising Index will be found on page 138



A New Type Standard Engine

Another World's masterpiece is created.

Intensified pleasure is opened to you; that additional *last mile*, without sacrifices.

This new triumph is a constant full load engine turning 550 to 600 R.P.M. It is the engine crystalized by War's work, where War's demands were *your* demands magnified *infinitely*. It is fundamentally an engine of time-proven STANDARD design with new developments incorporated which make possible the first complete accomplishment of maintained engine speeds up to 600 R.P.M., under endless, constant, full-load service.

In this engine the heretofore theoretically perfect cylindrical combustion chamber with valves in the head is a practical fact.

Friction of inlet and exhaust gases is all but eliminated.

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Phenomenal horsepower for bore and stroke is generated in the engine and delivered to the shaft with perfectly even turning movement.

All the features so wished for in the really high speed cruiser are realized together: safety, power, speed, economy, noiselessness, cleanliness.

Demands for this new type engine are ahead of production.

Write us your boat conditions for recommendations on maximum power.

Back of the STANDARD guarantee is the

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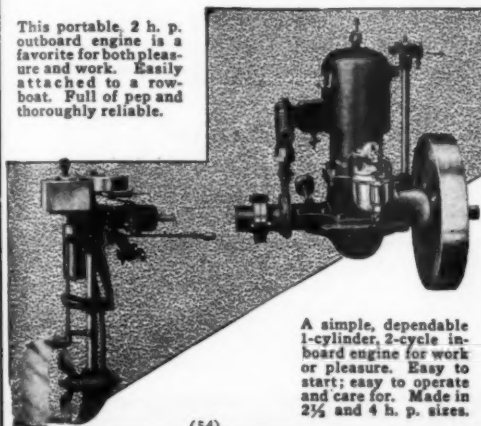
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One of These Will Meet Your Needs

Somewhere in the line of Lockwood-Ash Marine Engines is one that will meet your needs.

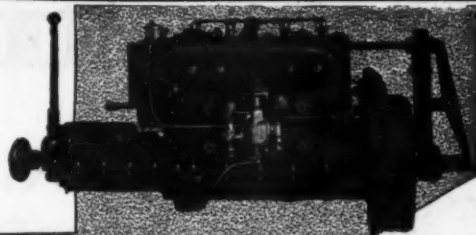
From the clean-cut, sturdy 2 h.p. outboard engine to the big four-cylinder power plant are varieties in size to cover a wide range of power and speed requirements.

This portable, 2 h. p. outboard engine is a favorite for both pleasure and work. Easily attached to a row-boat. Full of pep and thoroughly reliable.



(54)

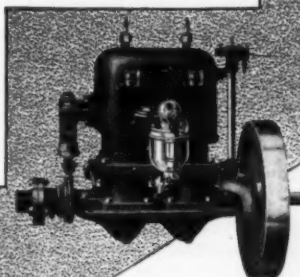
Big brother of the Lockwood-Ash Engine family, a highly developed 4-cylinder, 4-cycle marine power plant. Rugged and dependable. Delivers up to 20 h. p. Built with or without rear starter.



Why Lockwood-Ash Engines are Worthy of Your Choice

Lockwood-Ash Marine Engines are products of an institution which always has placed quality first. Experience has pointed out the sizes that make up the well-selected line, and the quality standard has dictated the thorough workmanship which is in every Lockwood-Ash Engine.

Ask for the booklet that tells all about Lockwood-Ash Engines. Also ask about the 30-day trial plan.



A light, compact 2-cylinder, 2-cycle all-purpose engine, of few parts and readily accessible. Made in three sizes, 6, 8 and 12 h.p. The largest size should deliver up to 15 miles per hour.

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LOCKWOOD-ASH

MARINE  ENGINES

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Send for our Booklets "How to Make Your Boat Leakproof" and "Marine Glue—What to Use and How to Use It"



Any old boat, so long as the frames are in fair condition, can be made water-tight by following the instructions in the above booklets. This applies to anything that floats from a canoe to a yacht—wood or steel.

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For more than 75 years Jeffery's Marine Glue has been the choice of the foremost boat builders of the world.

Jeffery's is a product that has not varied from the strict line of quality—it is not a competitive commodity made to meet a price.



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THE JOHNSON MARINE REVERSE GEAR

A Fine Gear for Fine Motors

The Johnson Marine Reverse Gear for 1920 will maintain the same distinctive qualities that have made it the favorite of boating enthusiasts the world over. With improved manufacturing facilities we hope to meet the demands of fine motor users for truly appropriate reverse gears.

Johnson Gears are made in five practical sizes, for light and medium powered motors. In material and workmanship, they represent the very best that can be obtained. If you want good equipment for your boat, be sure to include a Johnson Gear.



Exclusive Johnson Features

Special hardened alloy steel in all gears and shafting. The well-known Johnson Friction Clutch on both forward and reverse drives.

Radial and thrust ball bearings incorporated in the gear itself. The whole completely enclosed in an oil-tight case.

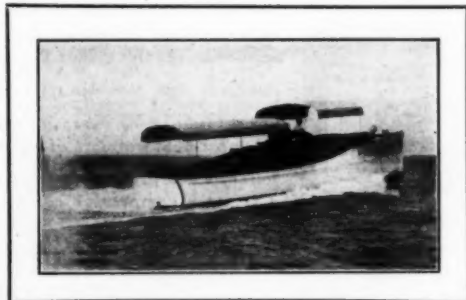
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THE CARLYLE JOHNSON MACHINE CO. MANCHESTER, CONN.

The Best Amateur Built Runabouts and Cruisers are

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HAND -V- BOTTOMS



And they are also the best boats if built by boat builders

WILLIAM H. HAND, JR.

Naval Architect

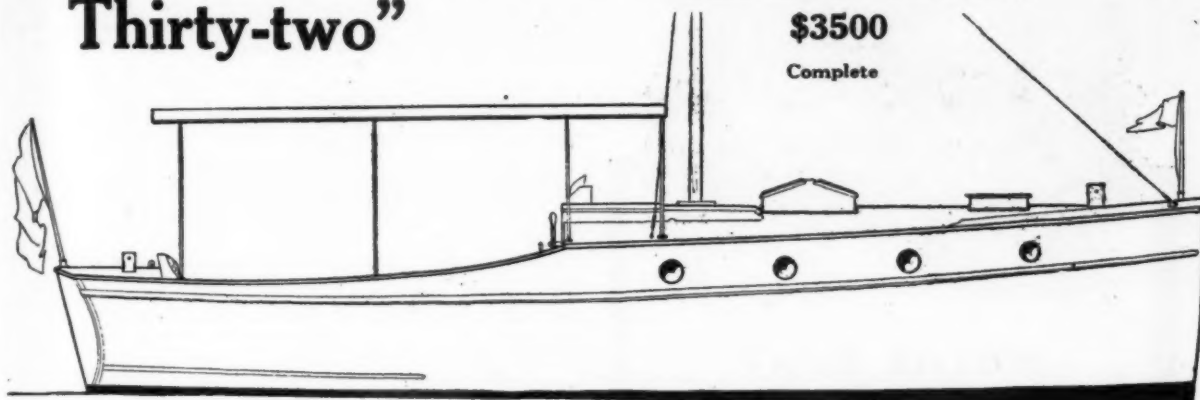
NEW BEDFORD, MASS.

"International Thirty-two"

1920 Standardized Cruiser-Cockpit Type

\$3500

Complete



The Hit of the New York Motor Boat Show

OF all the handsome boats and fine engines exhibited at the New York Motor Boat Show none attracted so much genuine interest, or as far as we know received so many bona fide orders as the "International Thirty-two." The International exhibit shown on page 7 entertained a constant stream of guests,—morning, noon and night throughout the show,—and they were not merely curious visitors, but they came to inspect, to study, to approve and to buy.

If anything was needed to confirm the popularity and practicability of International design and construction, the warmth of the reception of these boats by the boating public during the show proves beyond question that they are just the size and type of cruisers desired by the greatest number of prospective boat buyers.

If you did not visit the New York Show and see the "International Thirty-two," come to our plant at Nyack, near New York City, and see them under construction or write us at once for plan views and detailed information. You too will find we have just the boat you want, just the size, arrangement and accommodations, just the power, speed and equipment.

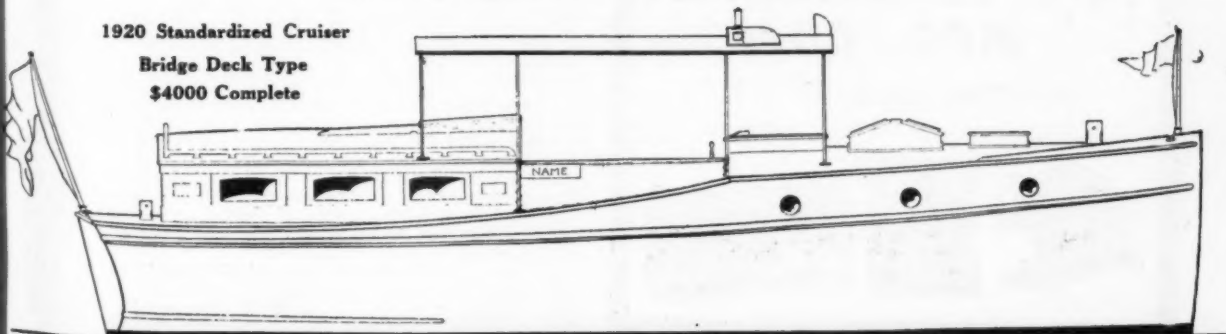
The "International Thirty-two" is built in two models, a cockpit type and a bridge deck type, each a marvel in convenience and roominess for a 32-foot cruiser. By building these boats in quantity, absolutely standardized in construction, finish and equipment, we are able to produce a boat built of the best materials and of the most approved construction, completely equipped and beautifully finished, at prices impossible for any other builder to meet.

*Orders for spring delivery must be placed without delay.
Write today for details.*

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SHIPBUILDING AND MARINE ENGINEERING
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1920 Standardized Cruiser

Bridge Deck Type
\$4000 Complete



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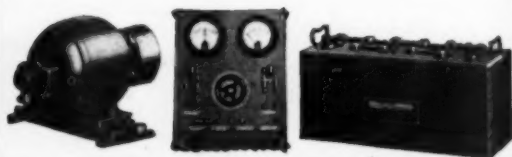
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craft of every descrip-
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6-12-32 VOLTS
4 TO 40 LIGHTS

Catalogue upon Request

THE
**A-C ELECTRICAL
MFG. CO.**

DAYTON, OHIO, U. S. A.



Rating and Racing of Motor Boats

(Continued from page 16)

adhered to. A boat may start not to exceed fifteen minutes after its fixed starting time but no deduction for such late start will be made from the finishing time. A boat starting after a lapse of more than fifteen minutes from its fixed time becomes automatically disqualified.

6. Any boat finishing a race two per centum or more faster than its computed running time will be disqualified.

7. Any boat arriving more than thirty minutes after the winning boat is disqualified from consistency points for finish

Suspension of Rules.

The Regatta Committee shall have the power to suspend any of these rules by stating their suspension in the instructions for the race, or by agreement with the owners of the competing boats.

Prizes.

1. Prizes will be awarded in the scheduled events, according to the order of finish as specified in Rule 3, paragraph 3.

2. A prize will be awarded at the end of the season to the boat having the most consistent performance record in the club's official schedule of events, the points for which will be computed as follows:

Races.

Start 1 point
Finish 2 points

Total 3 points

Cruises, Total: Three points to all boats reporting at designated cruise destination within the cruise period.

Special Events, Parades, Etc., Total: Three points to all boats participating.

3. In case of a tie between two or more boats for consistency, at end of season, the boat having the highest place record among those tied will be adjudged the winner.

4. In providing consistency rating for the season, the Regatta Committee will exercise its judgment in so arranging the schedule, as to equalize the award of points for consistency as between cruisers and open boats.

5. The winning of the cup for first prize by a boat in any of the official racing events of the club during the season automatically disqualifies it from winning the consistency cup.

To illustrate how these rules worked out in practice the results of a typical race over an off-shore course of 18½ miles in length are given below. In order properly to analyze the figures it is necessary to give a brief description of the competing boats, of which there were fifteen.

Name of Boat	Type	Length, Feet	Horsepower
Beach.....	Open launch.....	25	12
Bess Claire II.....	Cruiser.....	36	25
Capri.....	Cruiser.....	26	15
Gipsy II.....	Cruiser.....	32	10
Hirondelle.....	Runabout.....	19	8
Jane.....	Cruiser.....	20	6
Narragansett.....	Cruiser.....	38	20
Oreana.....	Runabout.....	20	6
Sunshine II.....	Cruiser.....	35	15
Tonka.....	Cruiser.....	26	12
Uandi.....	Cruiser.....	36	24
Visitor.....	Cruiser.....	26	8
Venus.....	Cruiser.....	25	12
Waukon.....	Cruiser.....	31	15
X-q-q-me.....	Open launch.....	22	6

Tabulation of Results of 18½ Mile Race

Name of Boat	Computed Time			Actual Time			Variation	
	Hrs.	Min.	Sec.	Hrs.	Min.	Sec.	Min.	Sec.
Beach.....	2	55	45	2	46	17	9	8 fast
Bess Claire II..	2	7	39	2	7	10		29 fast
Capri.....	2	28	0	2	25	28	2	32 fast
Gipsy II.....	2	34	10	2	29	51	4	19 fast
Hirondelle.....	2	28	0	2	12	38	15	32 fast
Jane.....	2	37	25	2	39	58	2	33 slow
Narragansett...	2	12	35	2	11	15	1	20 fast
Oreana.....	2	40	20	2	33	12	7	18 fast
Sunshine II...	2	18	45	2	15	5	3	40 fast
Tonka.....	2	25	0	2	45	31	17	31 slow
Uandi.....	2	20	17	2	13	36	6	41 fast
Visitor.....	3	9	38	3	14	48	5	10 slow
Venus.....	Started but did not finish			2	33	9	14	24 slow
Waukon.....	2	18	45	2	42	19	4	11 fast
X-q-q-me.....	2	46	30	2	42	19	4	11 fast

Bess Claire II having finished nearest its computed time for the 18½ miles was No. 1, Narragansett 2nd, Capri 3rd. It will be noted that Jane lost third place by the narrow margin of one second.

Our season's experience was most gratifying and when the Regatta Committee submitted its report at the annual meeting they were given a sincere vote of thanks, a most pleasant and welcome contrast in comparison with the cussing out a Regatta Committee generally receives.

We have a comprehensive race schedule worked out for the 1920 season for which prizes have been liberally donated, and every skipper in the club is restlessly awaiting the opening of the season on Decoration Day.

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Specifications for 30-Foot V-Bottom Cruiser Katherine

(Continued from page 23)

bearded to carry out all lines of same above L.W.L., except at head, which is to be finished square with a $\frac{3}{4}$ inch brass half-round stem band, extending from top of head to a point about 2 feet aft of fore end of waterline, and neatly filed to show as narrow face as practical at and near L.W.L. Stem to be sided 3 inches and molded as indicated.

Stern: To be framed as indicated with two $1\frac{1}{2} \times 4$ inch radius pieces of oak, cut on radius of 5 feet. Center to be supported by 3 inch hackmatack knees as indicated, with four vertical cleats $2\frac{1}{4} \times 1\frac{1}{2}$ inches, spaced as shown, and $1\frac{1}{2} \times 3$ inch oak reinforcing pieces around edges to form backing for planking fastenings. Side, deck and bottom planking to run by edges of transom in usual manner. Transom double planked with $\frac{1}{2}$ inch white cedar.

Frames: There will be bent frames spaced 9 inches on centers formed as shown by cross section in construction plan. All frames under motor beds to be $1 \times 1\frac{1}{2}$ inch white oak. All other frames to be $1 \times 1\frac{1}{2}$ inch white oak. Heels of frames under motor beds to be tied together with $1\frac{1}{2}$ inch oak floor timbers which set on top of same, all other frames to be tied at heels with $1\frac{1}{2}$ inch oak floor timbers. Floor timbers fastened to frames with No. 10 copper wire nails. Frames to have oak fillers of the same width at bilge angles as shown.

Chines: To be of Georgia pine, in two parts, as indicated by plan. Both parts to run full length of hull in single lengths. Inner members to be $1\frac{1}{2} \times 4$ inches, set as shown and properly beveled. Outer member of Georgia pine $1\frac{1}{4} \times 2\frac{1}{4}$ inches to form square caulking seam, fastened securely to inner member with 2 inch No. 14 brass screws, spaced 12 inches. Inner member to be securely fastened to each frame with two No. 12 copper wire nails. All copper fastenings riveted over copper burrs.

Clamps: Main clamps to be of Georgia pine 1×3 inches, set as shown and extending full length of hull, scarphed at sheerline break. To be riveted through each frame head with two $\frac{3}{4}$ -inch galvanized rivets. Shelf clamps to be worked under beam of forward deck, to be 1×2 inches Georgia pine riveted through heads of frames.

Deck Beams: All deck beams are to be of white oak, sawn to form. Those in raised freeboard deck are to be $\frac{7}{8} \times 2\frac{1}{4}$ inches. Bridge deck and aft deck beams to be sawn to form, sided $1\frac{1}{4}$ inches and molded $2\frac{1}{4}$ inches. Cockpit beams to be of oak $1\frac{1}{2} \times 2\frac{1}{4}$ inches with ends set on and securely fastened to indicated riser of Georgia pine fastened to frames. Center struts to be provided under each cockpit beam, extending to apron below. Pit beams on $1\frac{1}{2}$ -inch crown.

Motor Beds: To be of $2\frac{1}{2}$ inches Georgia pine, set and bolted in accordance with plan. All parts to be very carefully and securely fitted together as indicated, and all bolts provided with nuts and heavy washers. Motor to be bolted to beds with galvanized bolts extending through fore-and-aft beds with nuts on under side.

Frame, in General: All exposed edges of stringers, clamps, chines, frames, deck beams, etc., to be neatly finished with chamfered edges. All parts to be carefully fitted to bear evenly and very securely fastened as specified.

Planking

To be of the best grade white Virginia cedar to finish $\frac{7}{8}$ inch thick in strokes about 5 inches wide amidships in topsides, with proper taper at ends. To be fastened through bent frames with No. 12 copper wire nails riveted over copper burrs. Seams to be caulked with cotton, run with paint and payed with white lead putty. All fastenings to be properly let in and bunged with white pine bungs. To be thoroughly planed and sandpapered to give a perfectly smooth finish.

Decking

Raised freeboard deck to be of $\frac{3}{4} \times 2\frac{1}{4}$ inches matched white pine or spruce fastened into deck beams with $1\frac{1}{2}$ -inch galvanized boat nails with heads let in. This deck to be planed smooth, heads of nails covered with putty and covered with a single piece of 10-ounce duck, layed in shellac or marine glue and ironed down into place with hot flat irons. Edges to be hauled down over sides and neatly tacked where same will be covered by ribband rail when in position. Flaps to be left around all deck openings, to be turned up on inner side of coamings when in position. Main deck, bridge deck and cockpit flooring to be of white pine $\frac{3}{4} \times 2$ inches with bunged fastenings. Seams to be caulked with cotton, run with paint and payed with black marine glue. Plank sheers in main deck to be of mahogany $\frac{7}{8} \times 3\frac{1}{2}$ inches, as indicated. There will be a removable hatch in bridge deck over motor.

Deck Joinerwork

Ribband Rails: Ribband rails to be of mahogany $1\frac{1}{4} \times 1$ inch, formed as indicated and set as shown by profile plan. To be bung fastened into place with brass screws. Ribbands faced with $\frac{3}{4}$ inch half oval brass from end to end. Ribbands tapered forward and at stern.

(Continued on page 94)

J. V. B.

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JOSEPH VAN BLERCK, the designer of this remarkable four cylinder engine, has been the recipient of congratulations and compliments galore. Boat Builders, Naval Architects and Boat Users have vied with each other in telling him that he has produced the masterpiece of his career.

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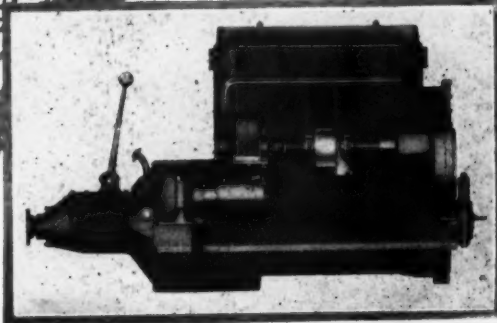
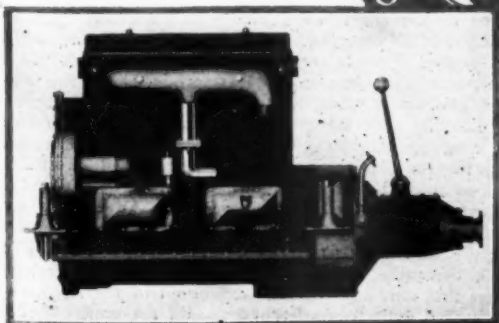
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Standardization Finally Reached

(Continued from page 64)

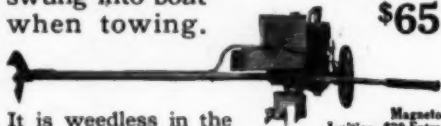
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was revealed to the public on Monday morning; but the Lawley boats were delayed until Wednesday. One of the most attractive designs of the whole exhibition was this Luders express which, powered with two Model GR Sterlings, was listed at a speed of 35 m.p.h. Of the many smart features pertaining to the construction of the boat, the one which seemed to attract the most attention was the leather-cushioned seat placed on the engine cabin just abaft the bridge. More than the fine lines of her bow, the tilted windshield or the dwarfed stack, this prominently placed seat seemed to convey the idea of speed. From impressionable souls lingering on the platform you would hear some such comment as, "Here, I'm captain of the packet, sitting up on that leather cushion and giving orders—quartermaster, ring up 45 on them there turbines and lay a course for Havana. We'll pull in before the soda fountains close for the evening."

Speed or motion, the suggestion of the former or the attainment of the latter—these are two things that will bring crowds to the booth of any exhibitor at a show, and the spaces which are provided with any little thing that moves are always to be counted on as obstructors of traffic in the aisles. The Delco-Light people had an exhibit which included a yard-arm blinker automatically regulated to spell out and ceaselessly repeat the name of this efficient lighting plant. After thousands of repetitions the brushes or some other part of the governing motor became worn and the blinker spelled something which resembled "Gelco-Light"—but the fascination of the winking bulbs continued to hold the interest of the spectators. Down on the main floor there was a cutaway model of a new slide-valve marine engine operated by belt power to disclose the functioning of the valve. Perhaps two persons in every hundred could look at that working model comprehendingly and tell their better halves what happened when the gadget went down and the gillickey uncovered the ports in the cylinder walls; but there wasn't an average of one per cent. who didn't flock around the motor as if he intended to buy one with his next pay check. Similarly, the hand-operated machines that provoke the cute little spark in the magnetos came in for their share of passionate attention, and the prospective owners of gyro battleship compasses had to be kept out of the enclosure with a rail fence and a half-inch wire cable.

But the show was so generally interesting that no visitor felt aggrieved if the crowd prevented him from seeing the wheels go around. In addition to all the old favorites in the marine motor line, there were such new exhibits as the Hall-Scott (shown in comparison with an airplane motor of the same manufacture to reveal the many differences between the two models), the J. V. B., which Joe Van Blerck considers his greatest creative effort, the Du Pont, the new Mianus heavy-oil motor, recent models of the Speedway, Sterling, Fay & Bowen, and a host of others. Express runabouts with half a dozen enticing dials and gauges on the instrument boards and mahogany sides that reflect beauty as does the mirror of a movie queen, inspired the sin of covetousness in masculine hearts; while aquaplanes and surf boards conjured up visions of the beach at Waikiki to thousands of business men who have tired of the northern winter.

It would not be possible in an article of this restricted length to mention by name the dozens of attractive exhibits that persuaded the benighted landlubber to become a motor boatman and inspired the old salts to pursue the sport with renewed vigor; but it is pardonable to mention in conclusion the nautical booth of the good ship MoToR BoatinG. This consisted of the chart house, bridge and forward deck of a sea-going yacht, equipped with sun shield, bridge dodger, ground tackle, ship's bell clocks (two of 'em, which told the same time at the same instant), steering wheel, fire extinguishers and many other articles of a motor boat's appointment. Leaning over the rail, which was stacked with copies of the magazine, Admiral Claude Edgett, of the circulation department, smiled his ingratiating smile and exerted his mellifluous voice to convince hundreds of fans that it was like being lost at sea to be a non-subscriber. As I came away from the booth I heard Admiral Edgett in dulcet tones repeating the burden of his refrain, "Won't you look at MoToR BoatinG, the pride of the printer's art?" and I was happy to realize that although the 1920 exhibition of the Association had uncovered many novelties, it was still the same old show.



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Specifications for 30-Foot V-Bottom Cruiser Katherine

(Continued from page 90)

Cockpit: To be formed as indicated with staving at sides and ends of $\frac{1}{2} \times 2\frac{1}{2}$ inches matched chamfered edge white pine or mahogany grained into oak coamings on cockpit floor. Joints to be set in varnish, to be as nearly watertight as possible. There will be two flush-type hatches in cockpit flooring as shown, trimmed with $1/16 \times \frac{1}{2}$ -inch hard brass fastened to cover seam when hatch is closed. All indicated facings to be of mahogany.

Companionway and Hatch: There will be a mahogany companionway entrance from bridge deck to cabin where shown. Same to be of the slide type, slide rails of $1\frac{1}{4}$ inch stock with suitable ledge for beam ends. Slide top to be of $\frac{3}{8} \times 3$ inches mahogany with splined seams. Doors to be neatly paneled, hung on suitable brass butts at sides and provided with proper all brass knobs and catches for locking. There will be a mahogany hatch on raised deck where indicated. Same to be fitted with a 6-inch deck light.

Hand Rails: Neatly made mahogany hand rails to be fitted where indicated by the plans. Same to be about $2\frac{1}{4}$ inches high, of the usual pattern, in accordance with plan.

Bits: Oak quarter bits 3×3 inches to be fitted properly where indicated. Same to be neatly finished and properly provided with $\frac{3}{4} \times 9$ -inch brass bitt pins. There will be a Hand pattern 3-inch brass bitt head on forward deck as indicated.

Interior Joinerwork

Ceiling: There will be no ceiling only as required for lockers, closets, etc.

Flooring: Cabin and around motor to be floored with rift sawed Georgia pine $\frac{3}{4} \times 3$ inches, layed on suitable floor bridges and across tops of frame heel ties. Center section in main cabin to be arranged to be removable and flooring around motor to be removable in sections.

Bulkheads: All indicated bulkheads to be $\frac{1}{2} \times 2\frac{1}{2}$ -inch matched chamfered edge white pine. On inboard edges of bulkheads will be turned mahogany columns $1\frac{1}{2}$ -inch diameters, rabbetted neatly on to bulkhead, as indicated. The forward bulkhead in toilet room will have neat opening over indicated lavatory, as required. Bulkhead from bridge deck to cabin top to be of $\frac{1}{2} \times 2\frac{1}{2}$ -inch matched chamfered edge mahogany.

Doors: All indicated doors to be of $\frac{3}{4}$ -inch mahogany with neat flat panels hung in suitable mahogany casings and suitable brass butts with neat knobs and catches.

Toilet Room: Toilet room located as shown, to be finished in white pine. To be fitted with water closet with mahogany seat and cover, and all nickel-plated trimmings. To be properly installed with discharge and supply sea cocks, as recommended by the manufacturers of the closet. There will also be a mahogany and nickel-plated folding lavatory as shown, properly connected.

Main Cabin: All pine to be finished in white and all mahogany doors and trimmings in varnish. Transoms to be of white pine arranged as indicated with drop panels. Casings around drop panels, columns, and small trim of mahogany.

Galley: To be located at aft end of cabin, to be arranged with a stove platform with ice chest under on starboard side where indicated and with shelf over as shown. Ice chest to be built of two thicknesses. Inside sheathing to be of $\frac{1}{2} \times 3$ -inch tongue-and-groove white pine, with ice compartment at top and food compartment below. Ice compartment to be lined with sheet zinc and refrigerating compartment to be shellacked. Outside sheathing to be of tongue and groove beveled edge white pine, finished in paint. Doors to be of white pine of regular ice chest pattern. A 1-inch air space to be left between the two thicknesses of sheathing. Ice compartment fitted with suitable drain to lead water overboard. Stove shelf on starboard side to be arranged to properly fit a two-burner alcohol stove, which is to be supplied by the builder and properly fitted in place. All woodwork under stove and adjacent to same to be neatly sheathed with 18-ounce copper. Space below stove to be fitted as locker for pots, pans, etc., with suitable shelves or racks over for dishes, also racks at side of stove. Finish to be in pine, painted white. A neat copper sink 12×12 inches to be fitted in dresser where indicated with suitable drain overboard and pump to fresh water tank.

Miscellaneous: Indicated steps in cabin to be of $\frac{3}{4}$ -inch mahogany, with rubber covered treads and brass nosings. All details of interior joinerwork to be complete and in accordance with the best practice.

Metal Work

Rudder: To be of bronze, Hand pattern No. 356. There will be a galvanized emergency tiller fitted to, square head of rudder stock.

Steering Gear: There will be a 17-inch wheel, scored drum cruiser steerer of proper height to conform with plan, properly fitted where indicated. To be properly connected with rudder quadrant by $5/16$ inch diameter, phosphor bronze tiller rope, led over suitable 3-inch sheaves.

(Continued on page 96)



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Choose a Doman for your boat and you have an engine that gets you the same snappy full-bodied power from kerosene that you ordinarily get from gasoline.

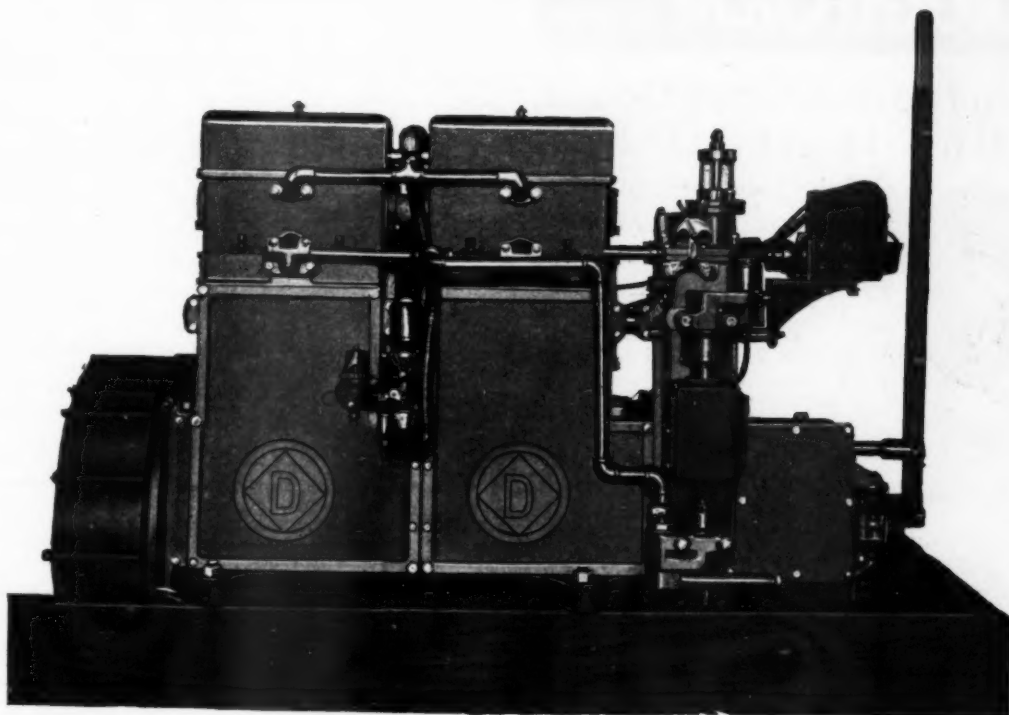
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Golden Glow Searchlights are especially suitable for boat use. Their mirror reflectors of special greenish-yellow glass give a peculiar yellow light which penetrates fog better than any other known light. The reflectors can never tarnish or corrode.

Golden Glow is produced in all sizes of searchlights for all sizes and types of boats. Write today for Catalog No. 159.



Electric Service Supplies Co.
Philadelphia New York Chicago
Manufacturers of Electrical Supplies

Specifications for 30-Foot V-Bottom Cruiser Katherine

(Continued from page 94)

Strut: To be a bronze casting to include strut and skeg in one piece. Hand pattern No. 462 with babbitt lining in hub. Securely bolted to hull with six 3/4-inch bronze bolts with nuts on inner side of apron and to shoe with six 5/16-inch bronze bolts. Heads countersunk in plates.

Air Ports: To be four 6-inch air ports on each side of main cabin, eight ports in all. With hinged part on inside of hull, and sleeve projecting through to outside. All metal parts to be neatly polished and fitted in the best manner.

Stuffing Box: To be a Mechanical Devices Company pattern K.S. No. 2 shaft log, fastened in place with 1 1/2 inch No. 14 brass screws.

Miscellaneous: Builder to supply and properly fit all necessary deck hardware of polished bronze, including bow and stern chocks, bow and stern flag staff sockets, cleats, companion locks and all other minor items necessary to complete the work in a workmanlike manner.

Motor Installation

The motor, a Model D four-cylinder Scripps, is to be supplied by the builder complete with all of its parts, including electric starter, reverse gear, shaft, propeller, storage battery, etc. It is to be properly and completely installed by the builder as will be directed by the owner. Gasoline to be fed to carburetor by a Stewart vacuum system through 1/4 inch soft copper tubing with necessary valves and strainer. Exhaust to be piped through indicated 2 1/4-inch galvanized pipe fittings to flange coupling. From coupling through stern exhaust will be led through 2 1/2 inch O.D. No. 18 copper tubing. All water piping will be of brass and all in accordance with the best standard practice. All instruments will be mounted on bulkhead forward of steering wheel.

Electric Lights

The motor equipment will include an electric self starter and storage battery. The builder will supply and properly fit and connect with battery the following approved electric lights:—In toilet room, one dome light; cabin, two dome lights; in galley, two dome lights. Motor compartment, two dome lights and one exploring light with cord and socket. The builder will also supply a set of approved electric running lights of suitable size for a Class 2 boat, properly installed, ready for service. There will be approved switches as required, and the lights will be placed as will be directed by the owner. A set of spare bulbs to be supplied by the builder for all fixtures.

Plumbing

Gasoline Tanks: Under the cockpit floor at sides there will be two seamless tinned steel tanks 14 inches diameter by 84 inches long, each with three transverse swash plates, standard filling plugs and gasoline outlets. Tanks to be supported in strong spruce cradles as indicated. Filler piped to 2 inch flush brass deck plates.

Water Tank: There will be a seamless tinned steel fresh water tank on port side where shown. Same to be 16x40 inches fitted with two transverse swash plates. To have standard filling plug and outlet bushing to fit 1/2 inch pipe.

Galley Pump: To be of suitable type, properly connected to water tank by 1/2 inch pipe.

Cylinder Oil Tank: There will be a seamless tinned steel tank for cylinder oil, 12x30 inches, on starboard side where shown. Tank to have two transverse swash plates. To be piped to base of engine with suitable brass pipe. All tanks to be rigidly fastened in spruce cradles.

Scuppers: Suitable 1 1/4 inch lead scupper pipes fitted in four corners of cockpit neatly flanged and fitted in usual manner. Suitable leather valve of usual pattern to be fitted over outboard ends.

Bilge Pumps: There will be a suitable 2 inch hand-type bilge pump, to be furnished by the builder. Same to have a 10 inch hose.

Painting, Etc.

Above indicated painted waterline shown in profile plan, the top sides are to be finished in four coats of the best white lead paint. Below waterline, the hull is to be finished with two coats of a good bottom paint over one coat of red lead. Canvas deck covering to be painted with three coats of straw color deck paint. The name and port to be put on stern in 3 inch plain block gold leaf letters. All interior pine woodwork and hull sides to be finished with three coats of the best flat white lead paint. Entire interior of hull, below chine, to be given one good coat of red lead and oil. All other parts of hull, including rails, decks, cockpit, companionway and mahogany inside trimmings to be finished bright, with one coat of wood filler and three coats of the best marine spar varnish, properly applied in the usual manner.

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IT'S a delight—this wonderful new Columbia Multiple Dry Battery for Motor Boat Ignition and Lighting. It doubles the joys of Motor Boating.

A Single Dry Battery of 4 to 15 Cell-power and Absolutely Waterproof

A solid unit—no joints—no connections to keep tightened—no metal parts to protect from rust or to keep in running order—just the 2 binding posts you see in the picture.

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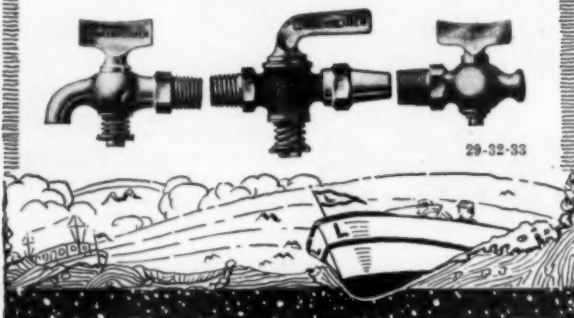
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A Cruise or a Sail

(Continued from page 40)

Ruth is a 38½-foot double-cabin cruiser with a beam of 10 feet. Her lines show an underbody with a maximum possible displacement, the object being to get as much displacement under water as possible.

Jerry is the largest cruiser, being a 40-footer and planned to carry a small spread of sail. She is primarily a motor craft but with plenty of sail should the power plant go wrong. The rig also offers many interesting advantages besides the safety factor. No attempt has been made to crowd the accommodations of a 70-footer into Jerry.

Penguin II, while the smallest of the fleet of Ideal Auxiliaries, being only 20 feet in length, is a very large boat for her size. She has full headroom, a large amount of closet space, plenty of room to move about in, both in the cabin and on deck. While her power is only 10 h.p., yet this is ample to drive the craft along at a fairly good speed when the wind fails.

Drift is a 20-foot sloop of light draft, large enough to carry a party of eight or ten and to accommodate two or three over a week-end.

In Victory, a 21-foot cat, the first essential considered was seaworthiness. The boat is of shoal draft, one that can take ground between tides without harm. She is first a sailing craft with power enough and with requisite qualities for two to eat and sleep and if detained by rain or storm.

Bonita is a 25-foot ketch which has already made a name for herself in coastwise work. The cockpit is intentionally made small to quickly rid itself of any water that may come aboard. The deck is extended inboard forming the seats and also the bridge deck over the motor compartment.

In Volante, a 25-foot yawl, special attention has been given to the sail plan in order to get the proper balance. In construction this boat shows a full rocker keel which gives it a good chance to grip the water and hold a straight course. It also gives an especially good hull from a seaworthy standpoint and makes a very strong construction.

White Cap is a 26-foot sloop designed after practices followed by the down easters. The accommodation plans would look ample for a boat twice the size of White Cap. By means of a raised hatch, full headroom is procured forward where it is most essential. There is a collapsible table that fits either in the cabin or the cockpit. This table folds up when not in use and slides into the space above the ice-box.

Little Pal is a 23-foot cat boat powered with a 5 horsepower Frisbie motor that nobody knows is there. The waterlines show a nice, fine entrance and the buttocks look good also.

Gob is a 28-foot V-bottom auxiliary, whose primary feature is an absolutely seaworthy boat capable of weathering any conditions that might be encountered off the New England coast. There are comfortable sleeping quarters for a party of three or four and the speed is good under either sail or power. The V-bottom type of underbody has been decided upon and a freeboard considerably lower than is generally found on most boats of her size is used to reduce wind resistance as much as possible.

Carine III is a 30-foot yawl of a type which should prove any one's ideal auxiliary. She can be easily handled alone yet at the same time she has comfortable cruising accommodations for a crew of several people. The plans show a boat having plenty of freeboard forward with a slight tumble-home aft. The hull is especially deep, which gives full headroom without the use of an excessively high cabin trunk.

Chester is a 35-foot yawl having lines closely resembling those of the Delaware Bay oyster boats which of course, from a seaworthy standpoint, cannot be improved upon. The boat has an easy entrance and a good run aft to aid her in sailing qualities. There is plenty of freeboard forward and the overhangs are short.

Josephine is a 35-foot yawl powered with a 15 horsepower motor. The fact that most auxiliaries are either out-and-out sailing craft of approved design with a small engine added that will drive the boat when the wind fails or assist in making harbor or else a regular motor boat with slight modifications and sails added, has been overcome. In designing Josephine the idea has been to combine a sailing craft and motor boat without sacrificing the desirable features of either.

Indrashama is a 35-foot schooner which should appeal to everyone. She is 50 per cent motor boat, the usual deep keel, large wetted surface and large amount of ballast of the sailing craft have been discarded as being too great a handicap for work under engine power. On the other hand, the double wedge form of hull, the light displacement and lofty topsides of the motor boat have been discarded as unsuited for work under sail power alone.

Pirate is the largest of the fleet of ideal auxiliaries, she being a 60-foot ketch. Of course in a boat of this size it is possible to get ample accommodations but the mistake is often made of not making use of the space to the best advantage. This idea has been kept in mind in designing Pirate and, as a result, a boat has been developed which is satisfactory from every standpoint.



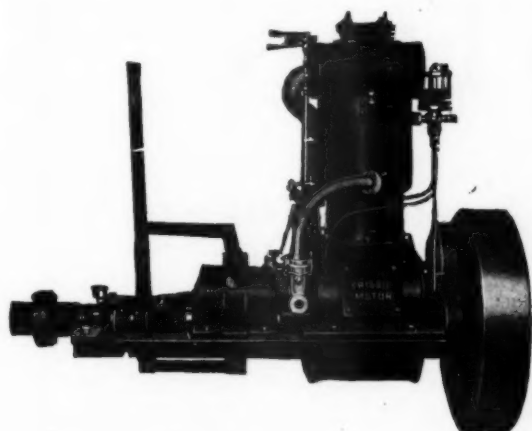
This boat is a 32 ft. Columbia River model, with an exceptionally large and high cabin, owned by Mr. Bentley of Wyatt Bay, B. C. He describes a trip to Vancouver which was made in 18 hours, 1/3 of the distance against a head wind, and 2/3 against the tide. The 1-cyl., 5 H.P. Frisbie with which it is powered never missed once during the 240 miles, and he used only 10 gallons of distillate and 2 lubricators full of oil on the trip.

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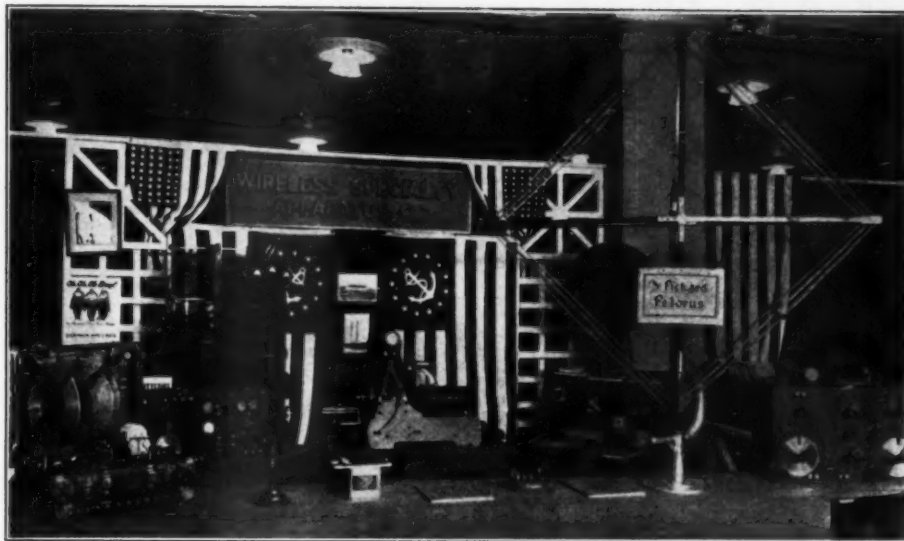
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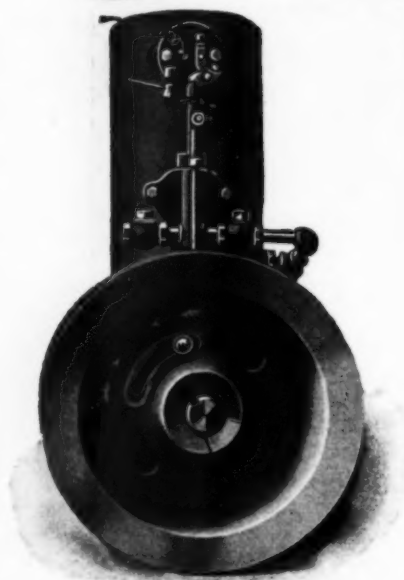
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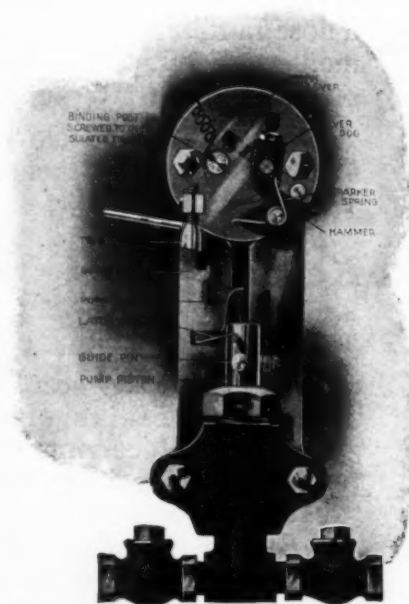
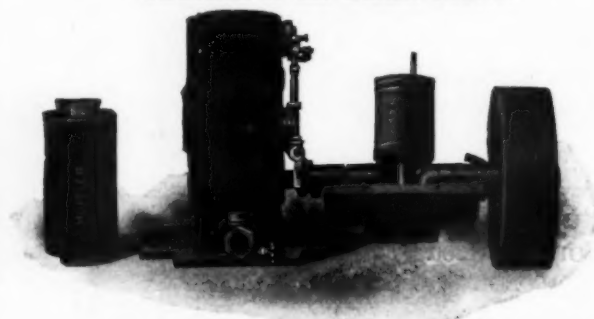
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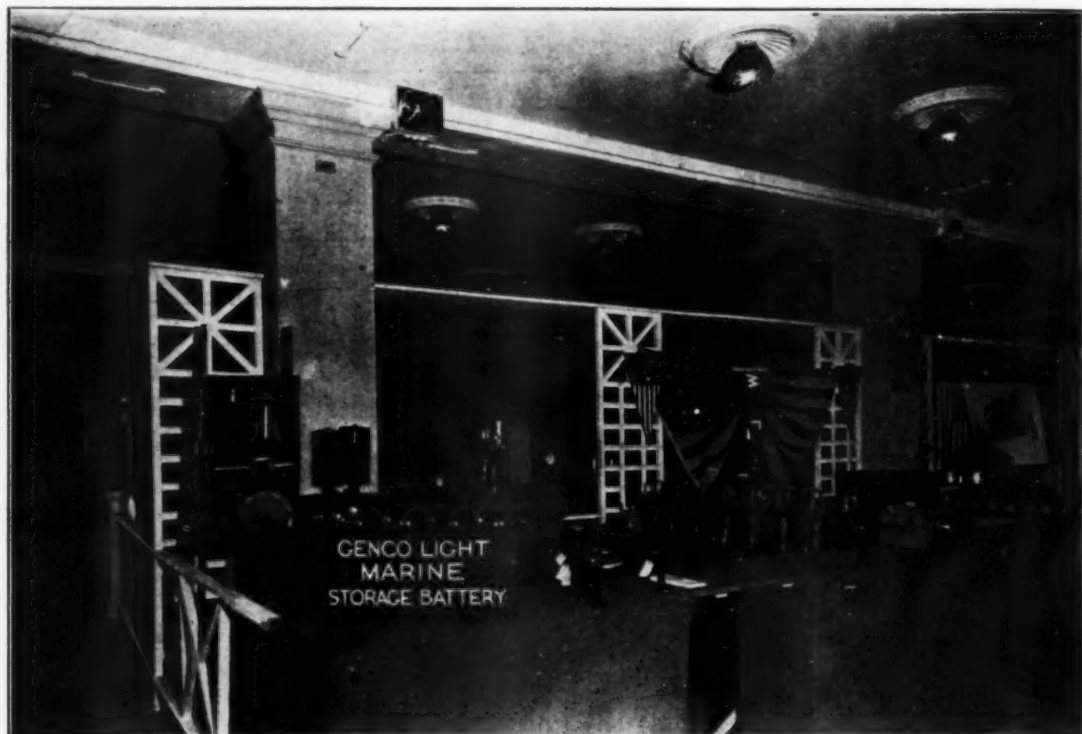


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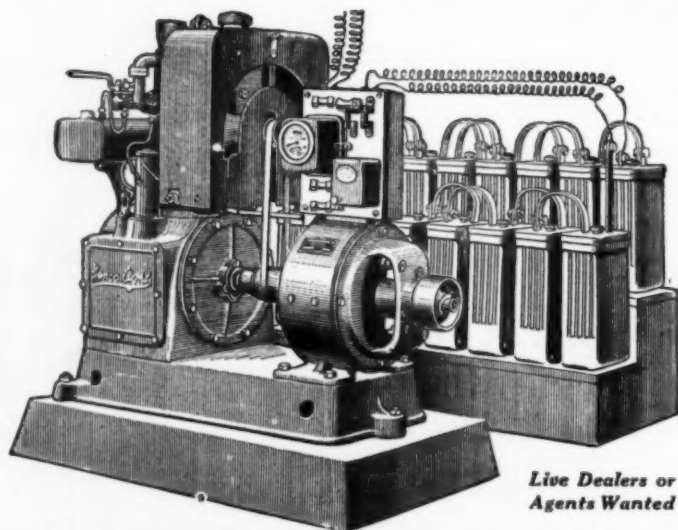
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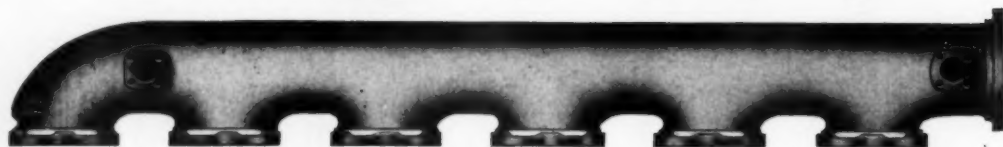
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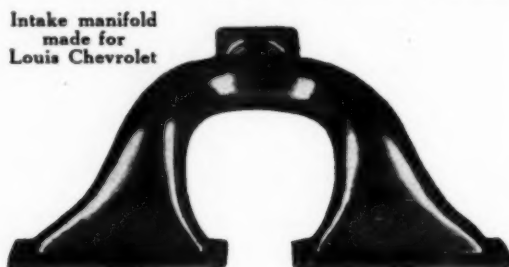


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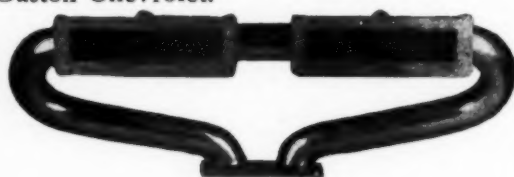
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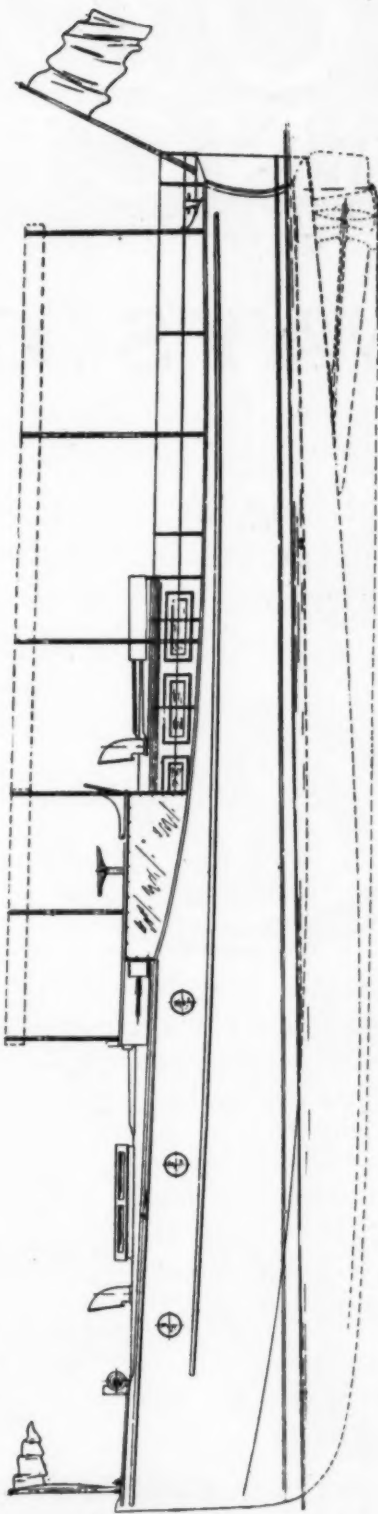
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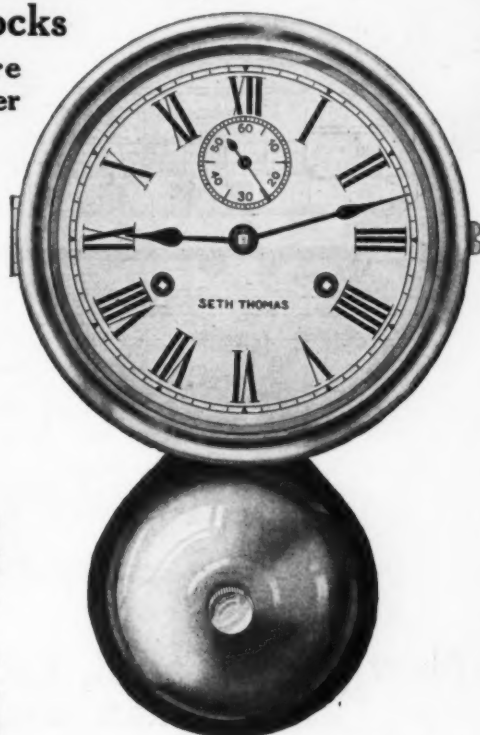
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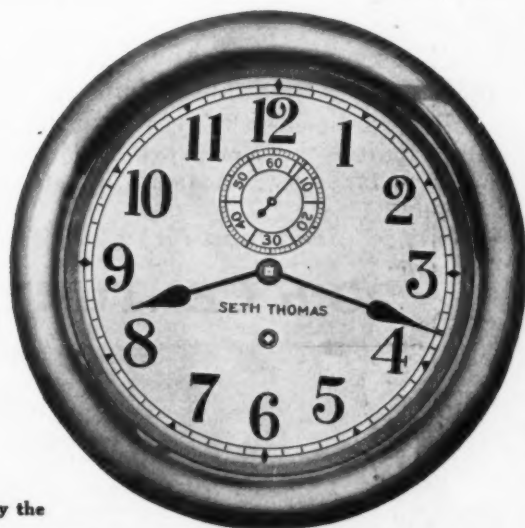
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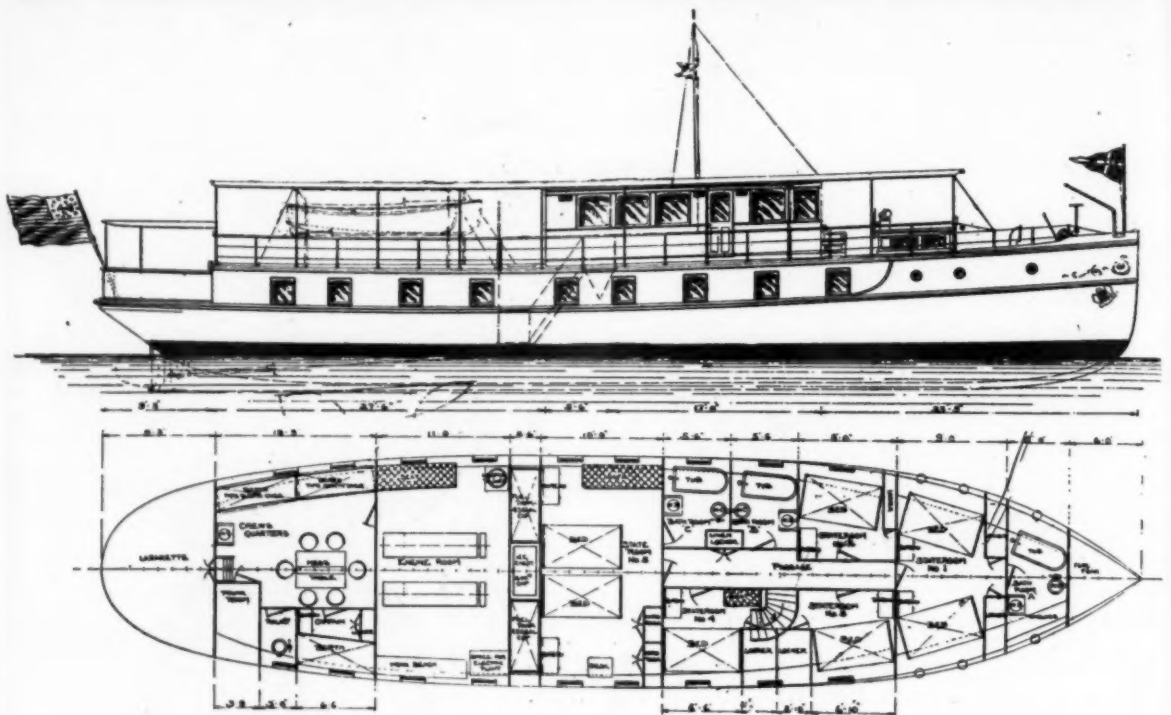
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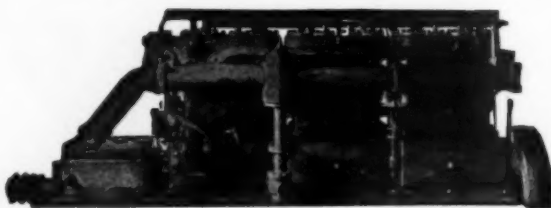
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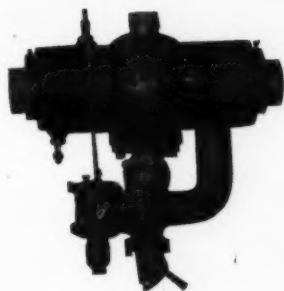
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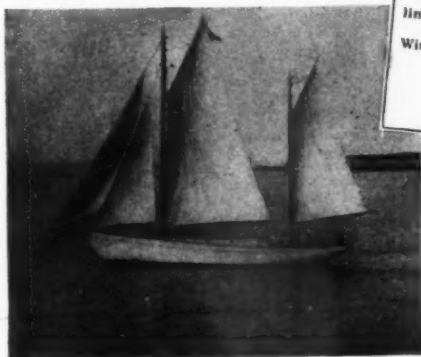
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Sept. 11, 1917

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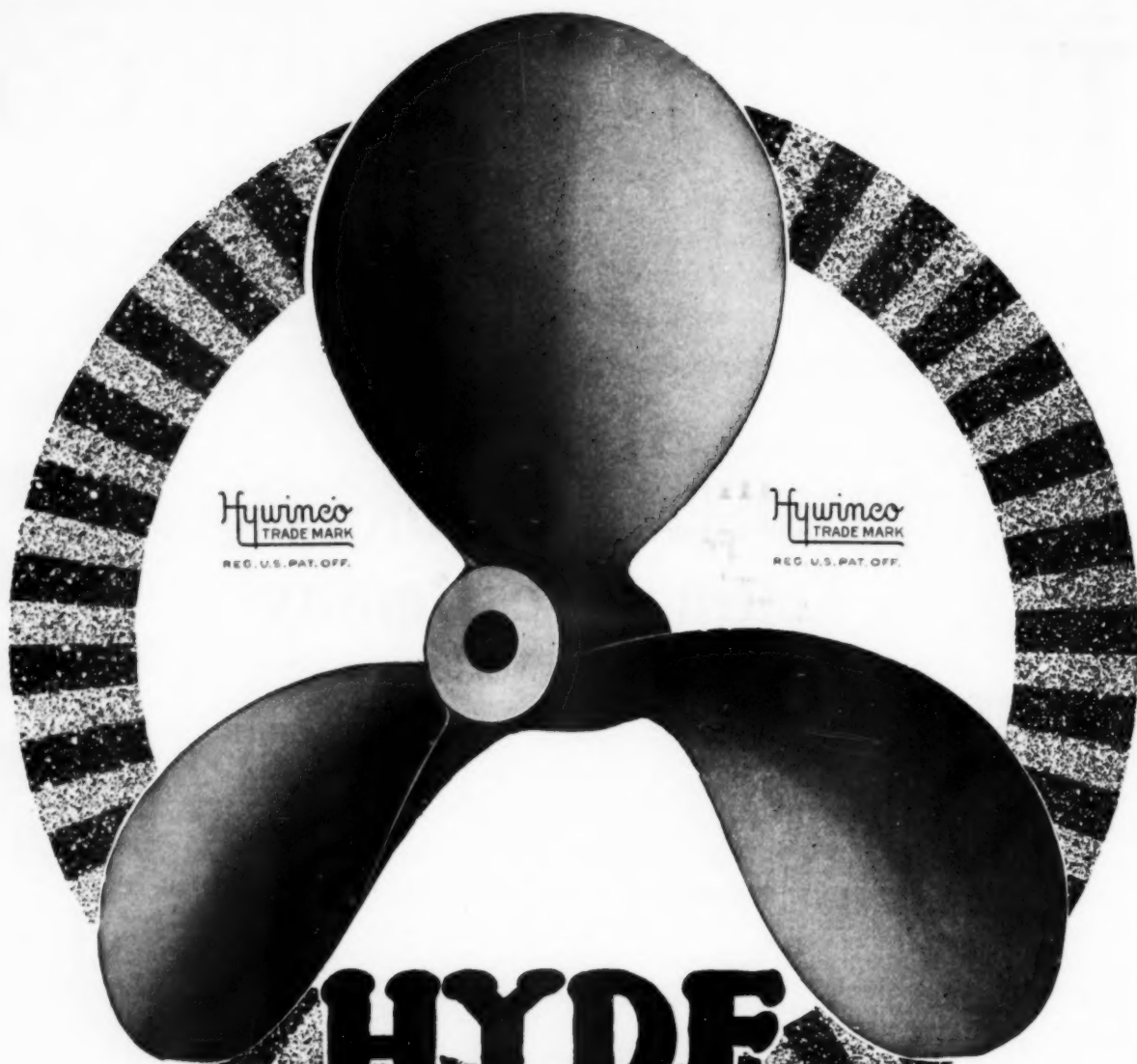
When one stops to consider that the equipment was new and not even limbered up it will be understood how severe the test was.

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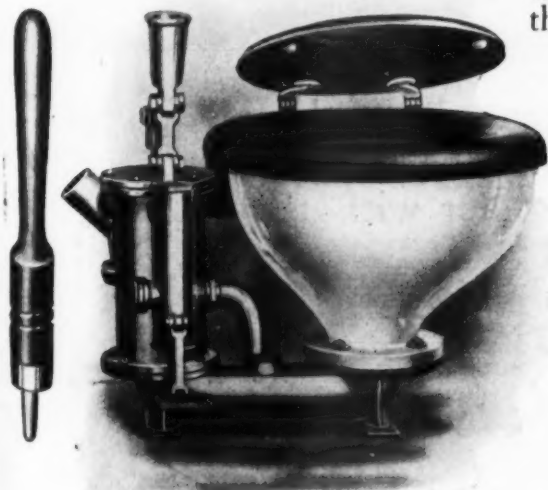
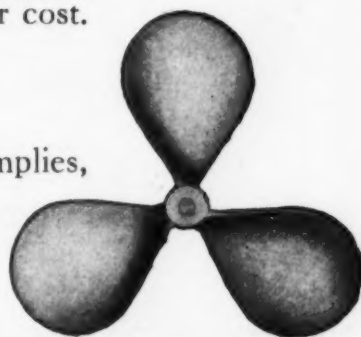
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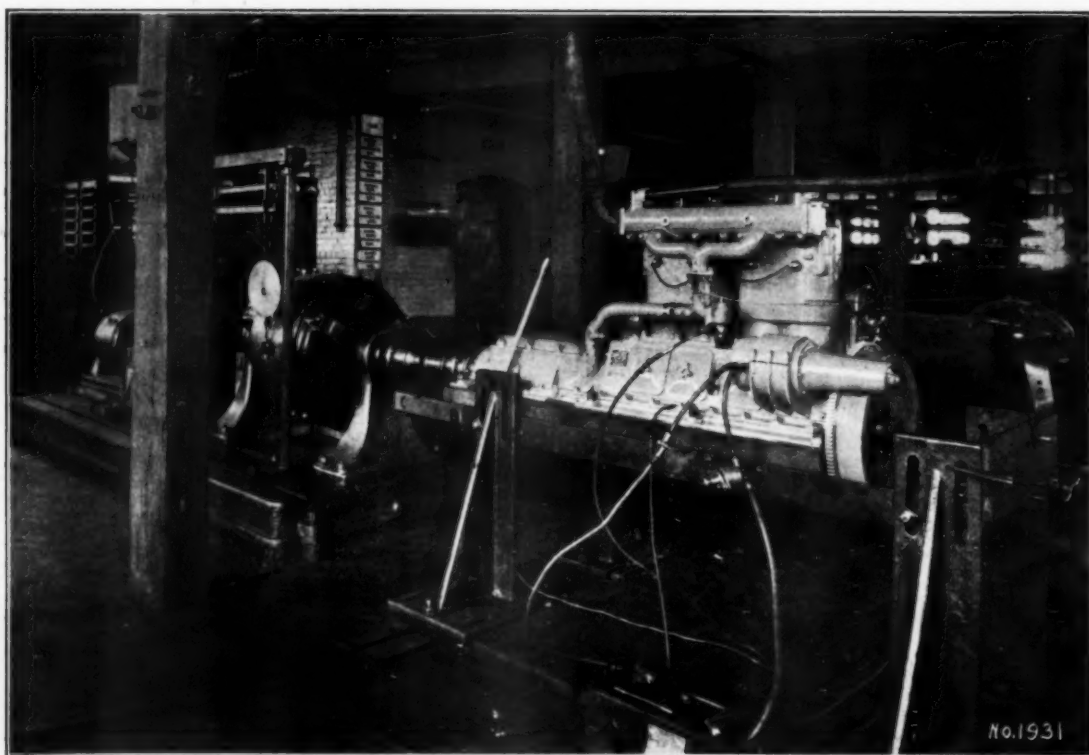
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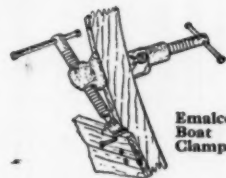
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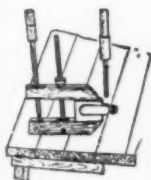
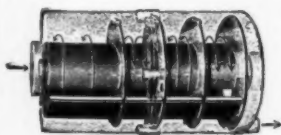
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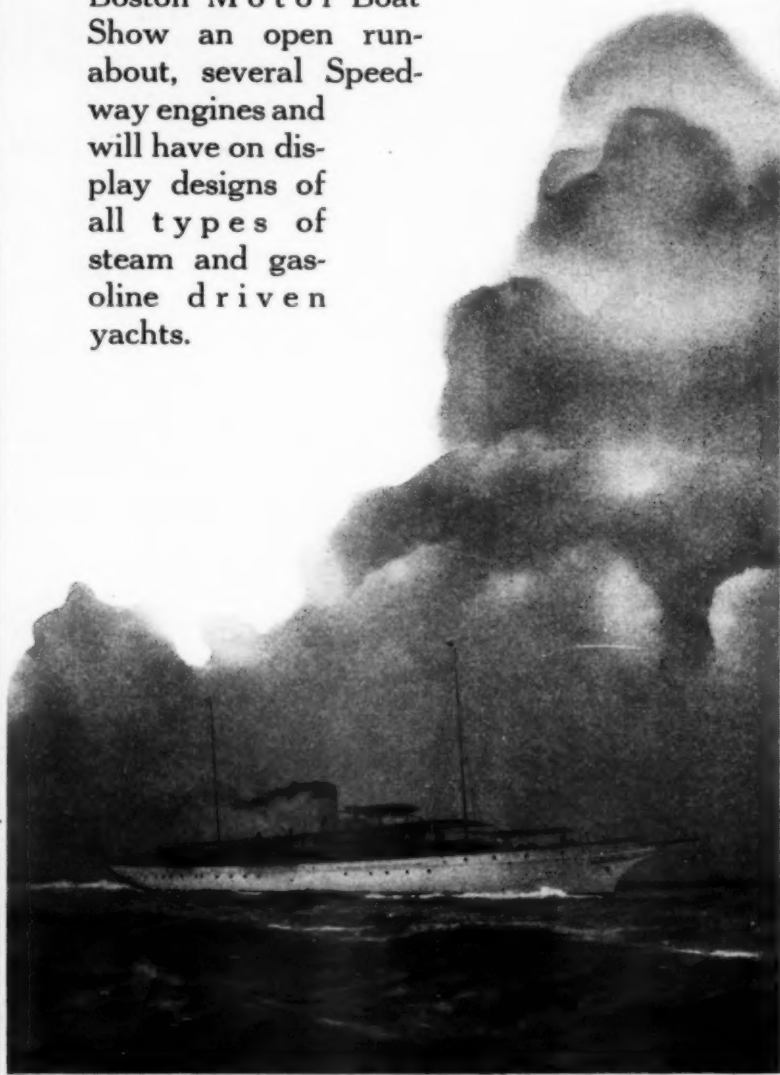
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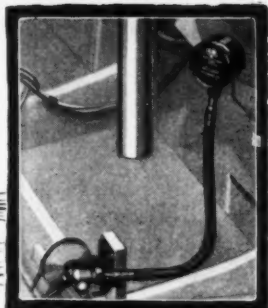
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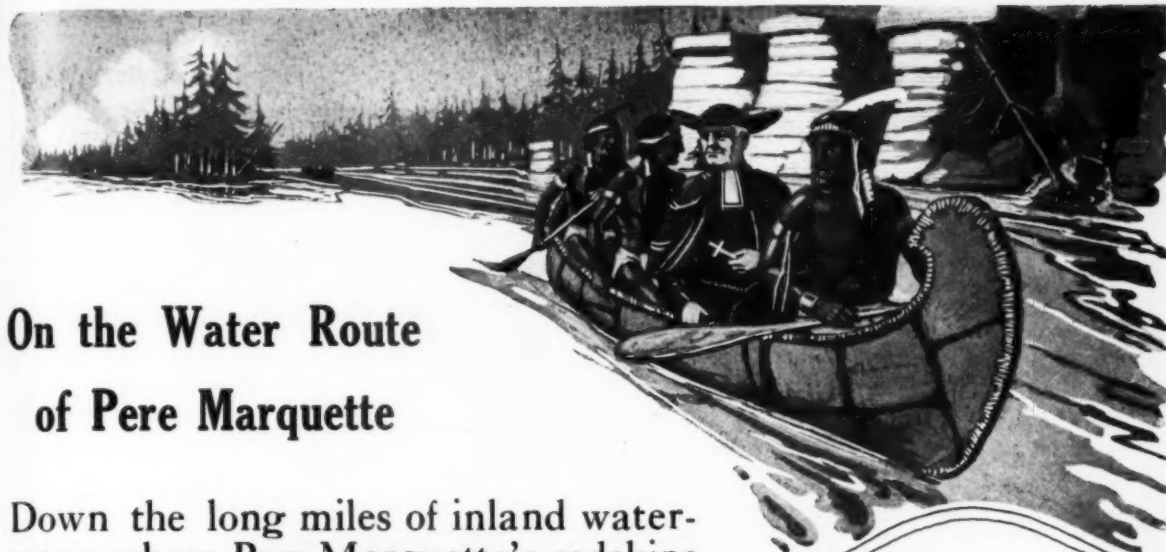
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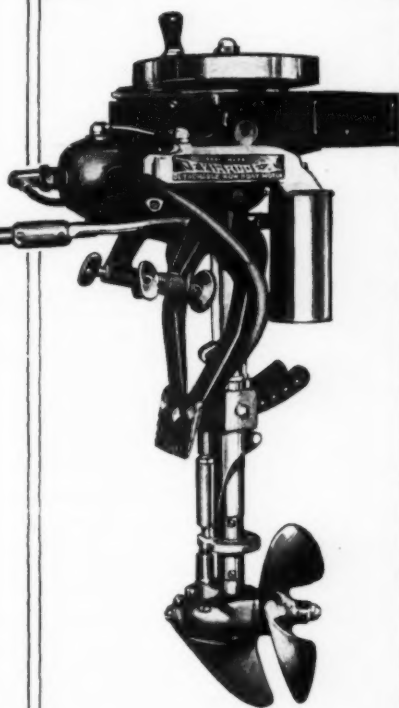
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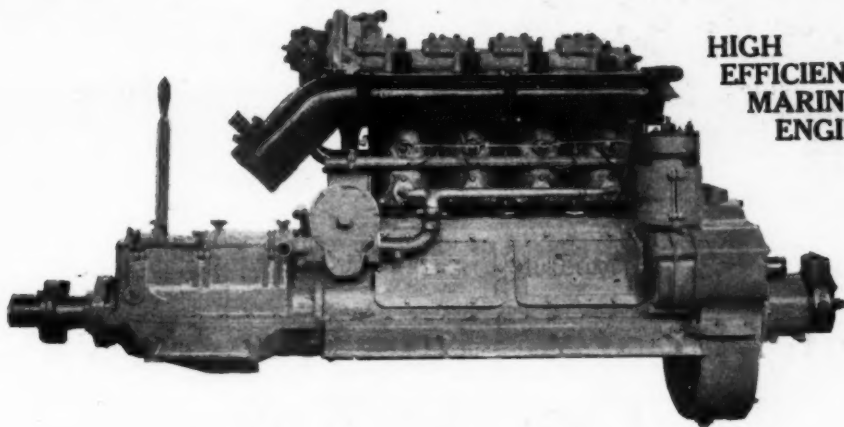
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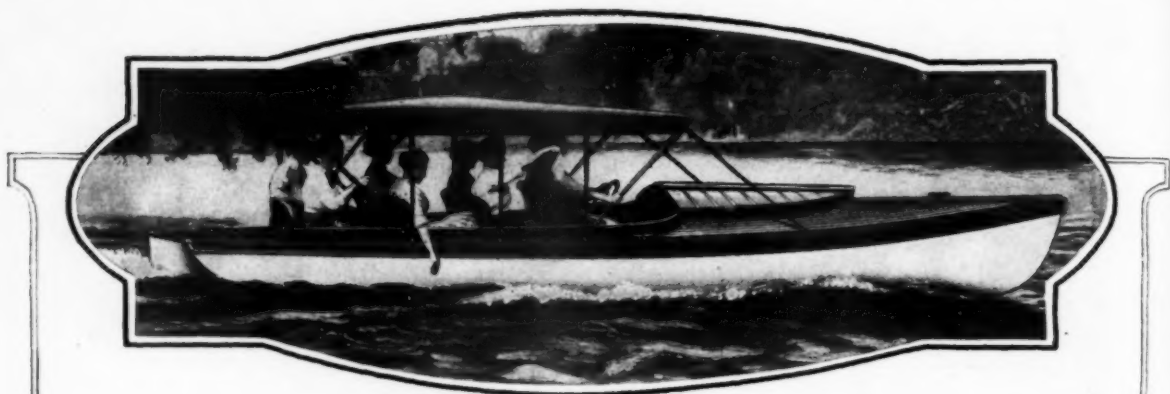
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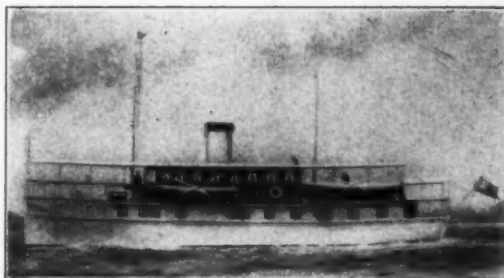
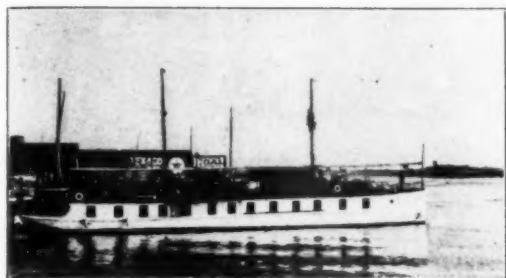
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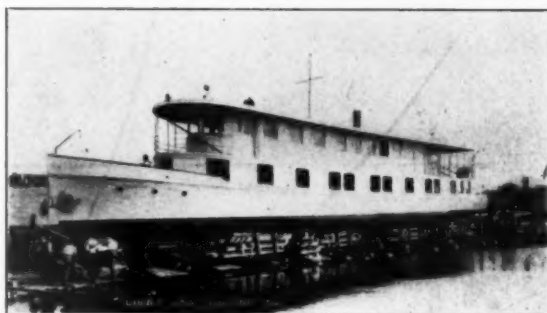
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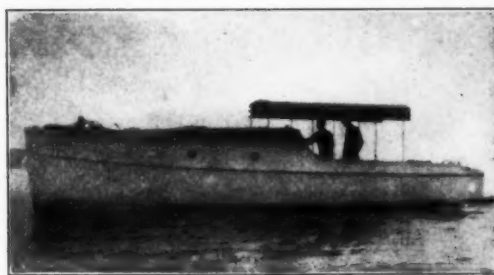
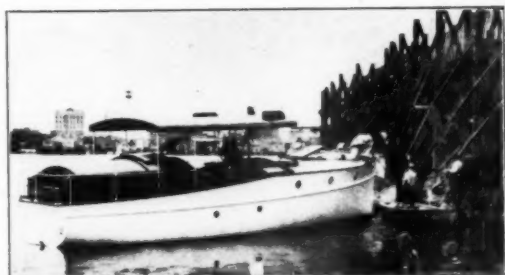
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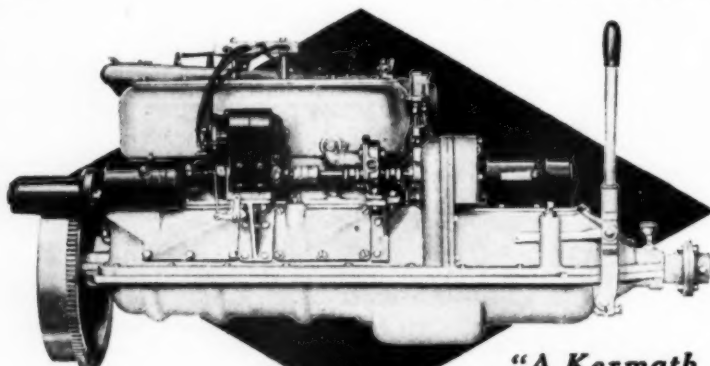
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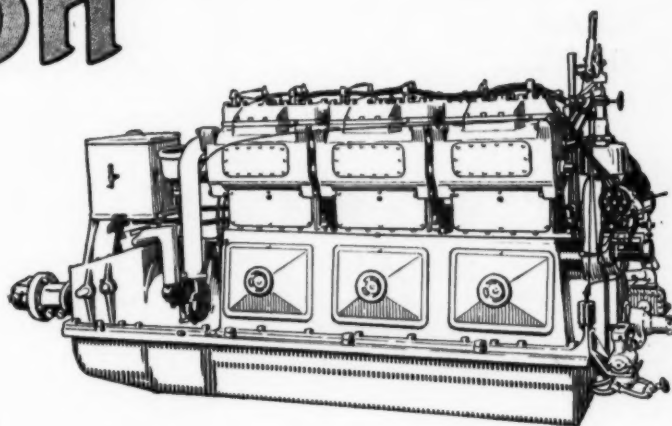


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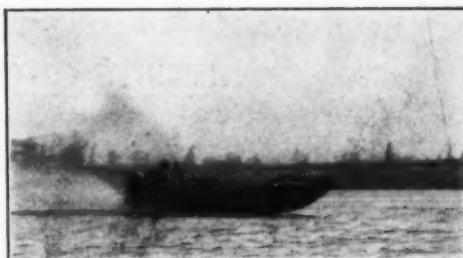
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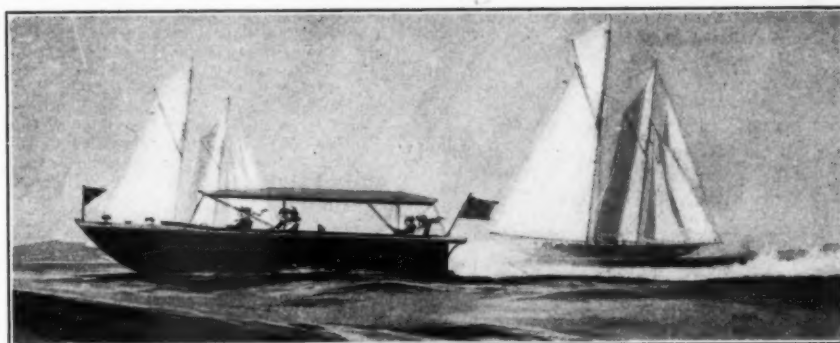
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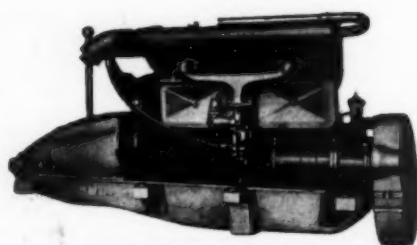
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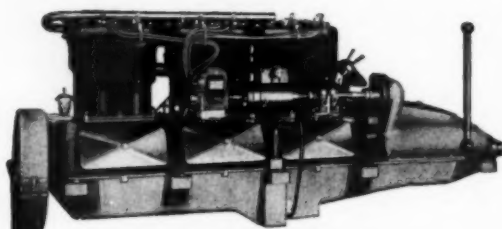


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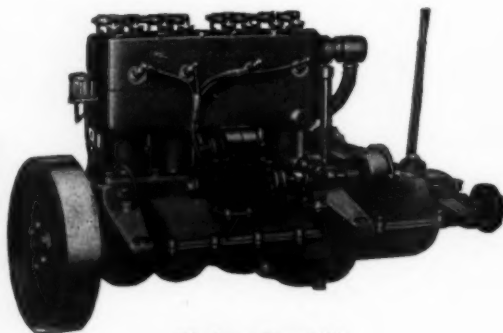
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"The world will wear
A beaten path to your door."
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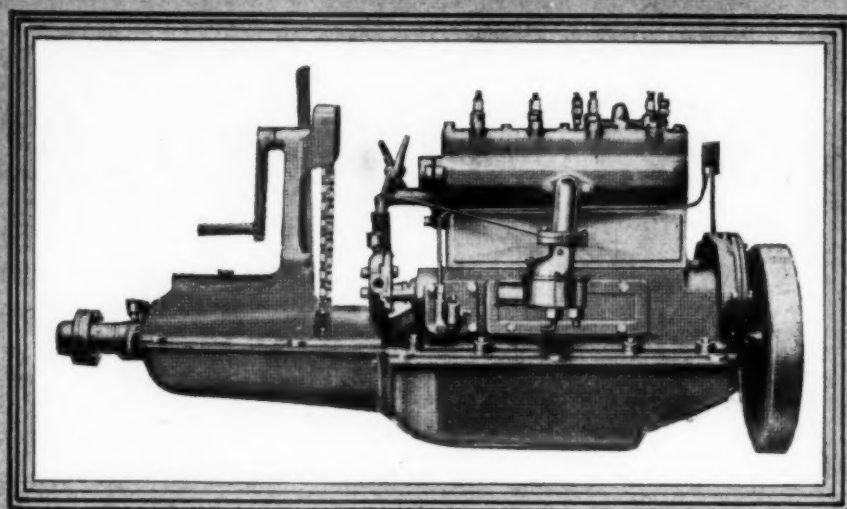
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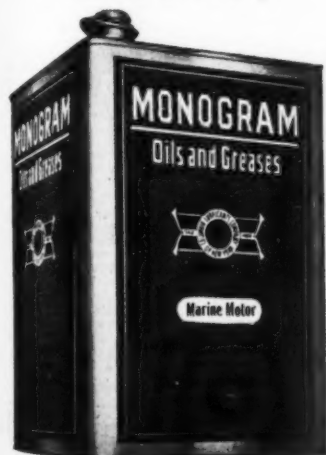
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MOTOR BOATING PRACTICAL HAND-BOOKS

Every motor boatman has long felt the need for a really complete and comprehensive library devoted to their favorite pastime—motor boating. One of the obstacles to the accomplishment of this important work was the difficulty in finding any one writer who could cover the field in its entirety. In presenting the new series of practical hand-books, MoToR Boating believes that the problem has been solved at last. These books are edited by Charles F. Chapman, M. E., the editor of MoToR Boating, and they are the results of months of untiring effort on his part, together with the best of thousands of suggestions sent to him by motor boatmen themselves. The list of the contents given below will give you some idea of the vast amount of ground covered by these volumes.

Practical Motor Boats and Their Equipment

Volume 1.—The first volume tells you what the ideal boat for various kinds of service should be and what to look for in buying a boat. Many suggestions about decoration and hints on all kinds of equipment. All about steering gears, wireless outfits, electrical attachments, etc. Glance over the list of contents appended herewith: Hulls, Ballast and Seaworthiness; Round Bottom vs. Sharp Bilge; What are the Advantages of Flare? Raised Deck vs. Trunk Cabin; Best Proportion of Beam to Length; Selecting a New Design; The Advantages of Bilge Keels; Open or Solid Deadwood? What Makes a Hull Seaworthy? The \$1,000 Cruiser; Buying a Second-Hand Boat; Types of Bows and Sterns; Exterior Arrangement of Cruisers; The Best Cabin Arrangement; Finishing Up the Cabin; Changes in Interior Arrangement; Interior Arrangement for Open Boat; Propeller-Rudder Arrangements; Best Position for the Rudder; Advantages of the Outboard Rudder; Different Steering Positions; Steering Equipments for Motor Boats; Steering Gear for the Cruiser; The Steering Gear for a Runabout; Steering the Boat from the Side; The Electrical Equipment; Making and Wiring a Switchboard; Electric Lighting on a Motor Boat; The Inexpensive Lighting Outfit; Wiring the Small Cruiser; The Storage Battery; The Dynamo Cut-Out; Wireless for a Small Cruiser; Tender for a Thirty-foot Cruiser; Building a Folding Dinghy; Installing the Boat Boom; What is the Best Galley Arrangement; Ventilating the Galley; The Galley Stove and Its Installation; Making a Fireless Cooker; A Portable Cook Box; Running Water for the Cruiser; How to Build a Portable Table; A Table for the Open Boat.

Practical Motor Boat Building

Volume 2.—As its title implies, this volume takes up the building of your own boat. It also covers the construction of the necessary fittings such as awning, windshield, etc. Every boatman sometime or other builds a boat, and a book of this kind will save much time and prevent many mistakes. List of contents: Types of Motor Boat Fastenings; Boat Building Woods; Laying Down a Boat's Lines; Converting a Trunk-Cabin Cruiser; A Steam Box for Amateur Builders; Joiner Between Stern and Keel; Fastening the Frames and Floors; Boring the Forgotten Limbers; Fitting the Garboard Plank; Boring the Shaftlog; Fitting the Stuffing Box; The Stern Bearings for a Cruiser; A Water-Tight Companionway; How to Canvas a Deck; Hinged Water-Tight Hatches; Making a Water-Tight Hatch; The Coming of an Open Boat; Fitting a Swinging Port Light; Making a Self-Bailing Cockpit; A Water-Tight Win-low Sash; Making a Water-Tight Skylight; How to Build an Engine Housing; How to Make an Engine Cover; Building a Tool Locker; Constructing an Extension Transom; How to Make a Pipe Berth; An Ice-Box for a Cruiser; Installing a Toilet; How to Rig a Signal Mast; How to Make a Spray Hood; Fitting a Folding Windshield; An Awning for the Open Boat; A Cover for the Open Cockpit; Screens for the Side Light; A Support for the After Light; A Seat for the Man at the Wheel; Removable Davits for the Cruiser; The Boarding Steps; A Bow Rudder for Your Hydro; The Motor-Driven Club Tender.

Practical Things Motor Boatmen Should Know

Volume 3.—Navigation is one of the important subjects covered in volume three of the series. Tells you how to steer, how to increase the factor of safety, and a host of other things relative to the proper running of your boat. The chart and compass are both fully explained in a clear and comprehensive manner. The list of contents will tell you more about it; Advice for the Beginner; Lessons Learned from Experience; Good Things to Know; Increasing the Factor of Safety; Which Way Should the Boat Steer? Why a Boat Steers Badly; Why do Boats Squat? Figuring the Boat's Speed; Ballasting the Cruiser; Getting Off Bottom; To Ride Out a Storm in a Motor Boat; The Why and How of Storm Oil; Preventing Fire; Handling Ground Tackle; Government Charts; Stowing the Anchor on a Cruiser; Diminishing Deviation; Preventing Electrolysis; Stowing and Using Charts; How to Make a Chart Case; Keeping a Motor Boat's Log; How to Make a Sextant; Tides and Tidal Waters; Taking Her Through the Canals; The Best All Round Dinghy; Towing the Tender; Handling the Dory in a Seaway; Getting the Tender Aboard; Planning for a Cruise; Equipping for a Cruise; Equipment for Offshore Cruising; Novel Events for Regatta Day; Handicapping; The Object of a Handicap Rule; Laying Off a Race Course; Measuring the Length of a Race Course; Preparing a Boat's Bottom for a Race; How to Build a Turning Buoy; Starting Boats in a Race; Stowing the Signal Flags; Fitting a Gun Mount; A Fish Box for Your Cruiser; A Cabin Wall Rack.

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Volume 4.—All about the marine motor; what it should and should not be. Tells why the automobile engine is unsuccessful in marine work. The best location for your engine, the ideal engine bed, the fuel tank, exhaust and countless other suggestions that will enable you to get the best results from your power plant. List of contents: Purchasing a Marine Motor; How Many Cylinders? Power per Cylinder; High Speed vs. Heavy Duty; Long Stroke vs. Short Stroke; Correct Motor Design; Changes in One's Power Plant; The Things that Cause Vibration; The Automobile Engine for a Boat; The Best Position for the Motor; The Ideal Engine Compartment; Placing the Engine in the Hull; Installing a Motor in a Canoe; Installing Power in a Yawl; Converting a "Banker" to Power Engine Installation in a Hydroplane; Putting Power in the Rowboat; Limits of Shaft Inclination; Constructing the Engine Bed; Getting the Motor Aboard; Lining Up the Propeller Shaft; The Best Exhaust; Mufflers vs. Under-Water Exhausts; Installing an Under-Water Exhaust; Primary Batteries for Ignition; Keeping the Ignition System Dry; Installing a High-Tension Magneto; From Make and Break to Jump Spark; Installing the Gasoline Tanks; Taking Care of Extra Gasoline; Spark and Throttle Controls; Constructing a Rear Starter; Propeller for Engine and Hull; Installing a Universal Joint; Gearing Motor to Propeller Shaft; The Automobile Throttle; Harnessing the Main Engine; Rebabbiting a Worn Bearing; Should Fuel Line be Inside or Outside.

Practical Motor Operation and Maintenance

Volume 5.—One of the most valuable books of the entire set. Your motor's ills and how to cure them. This volume tells you how to adjust your carburetor, how to fit piston rings, how to remedy poor compression and a number of other things that will enable you to doctor your own motor. List of contents: Locating the Motor's Troubles; The Overheated Motor; Starting in Cold Weather; Overhauling a Marine Motor; How to Save Fuel; The Fuel Situation; Using Low Grade Fuel; How to Run on Kerosene; Supplying the Fuel to the Carburetor; Adjusting the Carburetor; Cleaning the Fuel Tanks; Cleaning the Gasoline Line; Stopping Up the Leak in the Tank; A Home-Made Gasoline Gauge; Carrying an Extra Supply of Oil; Mixing the Fuel and Lubricant; Remedying Leaky Compression; Killing the Carbon Jinx; Tool and Spare Parts to Carry; Removing and Replacing Piston Rings; Repairing a Leaky Cylinder; Grinding a Motor's Valves; Setting the Valves; Timing the Ignition System; Cleaning the Water Jacket; Making and Fitting a Gasket; Patching Up a Bearing; Straightening the Sprung Shaft; Truing a Bent Propeller; Removing the Flywheel; Separating Couplings and Pipe Fittings; Changing the Shaft Hole Location; Utilizing the Exhaust; Disposing of the Bilge Water; Heating a Small Cruiser's Cabin; Operating the Outboard Motor; The Clean and Quiet Boat; Charging a Storage Battery; When the Motor Stops Unexpectedly; Making a Unit Power Plant.

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Advertising Index will be found on page 138

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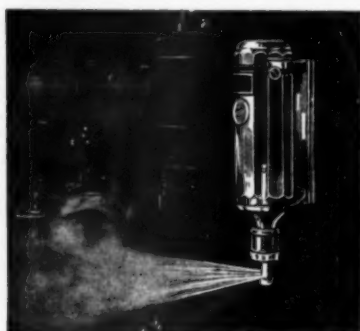
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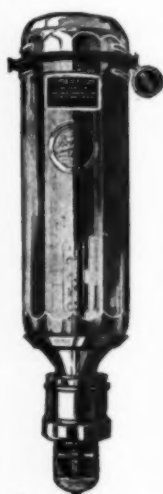
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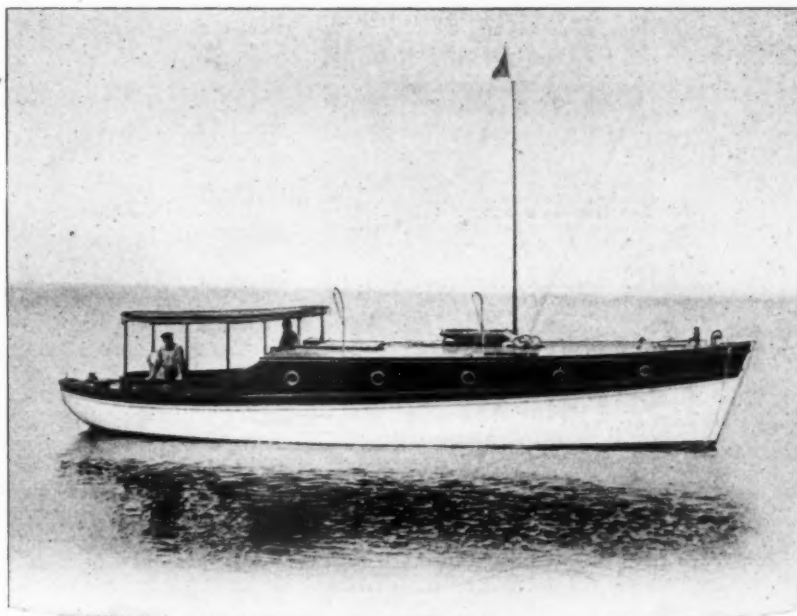


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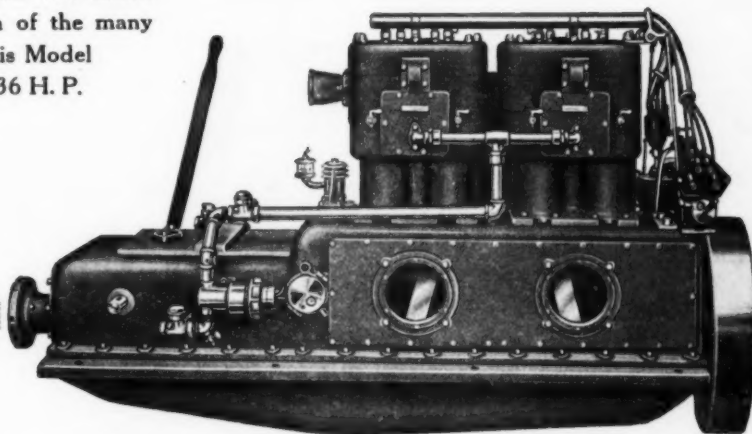
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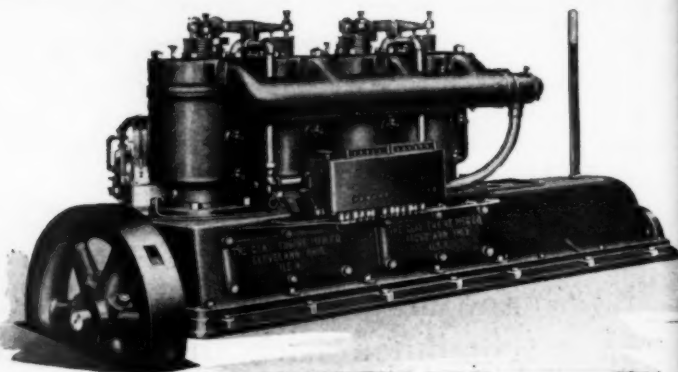


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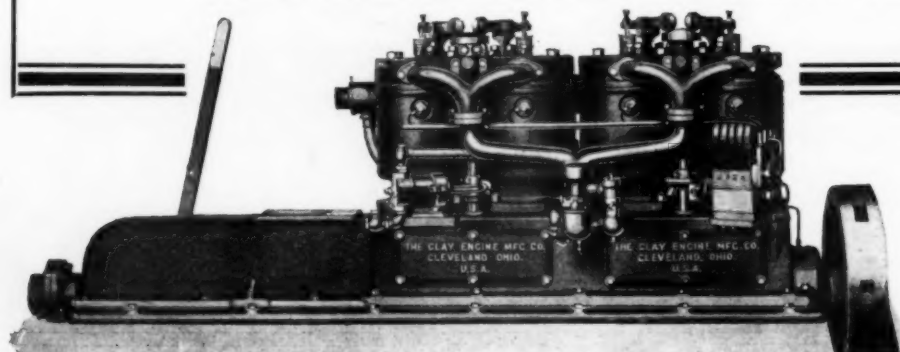
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